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The Convention of the American Pharmaceutical Association, American Association of Colleges of Pharmacy, National Association of Boards of Pharmacy and the Conference of Pharmaceutical Association Secretaries Will Be Held in Portland, Me., during the Week of August 20th.

Vol. XVII, No. 2 FEBRUARY, 1928

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE SEVENTY-SIXTH ANNUAL CONVENTION WILL BE HELD AT PORTLAND, ME., DURING WEEK OF AUGUST 20, 1928.

The 1928 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries will also be held at Portland, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, of Officers of Pharmaceutical Associations, Local Branches, see pages x, xii, xiv, etc.

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THE SEVENTY-SIXTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD AT PORTLAND, MAINE, AUGUST 20–25, 1928.

THE hotels at Poland Spring, Me., the place originally chosen for the 1928 meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, could not arrange satisfactory accommodations earlier than the week of September 10th. This date is too late for many of the members and especially for those connected with teaching institutions. The Council of the A. PH. A. has therefore changed the place and date of meeting as indicated above. This change will give anyone who desires to attend the A. PH. A. meeting, August 20th, and the N. A. R. D. meeting, September 14th, time to do so.

The National Association of Boards of Pharmacy, the American Association of Colleges of Pharmacy and the Conference of Pharmaceutical Association Secretaries will hold their annual meetings at the same time and place. The National Conference of Pharmaceutical Research will convene on the Saturday preceding, August 18th.

Portland is about twenty-five miles from Poland Spring and is the gateway to Maine summer resorts; the summer season, in Maine, closes about September 10th, therefore several weeks remain during which visitors may see this section of the country at its best. The trip permits of travel by rail or water or both, and nowhere is the climate more bracing nor is the scenery of this type surpassed in beauty.

The Eastland Hotel, which has been chosen as the official Headquarters, is of recent construction and modern in every particular. Edgar F. Carswell, of Gorham, Me., a former President of the Maine Pharmaceutical Association and a member of the Maine Board of Pharmacy, has been chosen Local Secretary.

ARRANGE TO ATTEND THE MEETING DURING THE WEEK OF AUGUST 20, 1928, AT PORTLAND, ME.

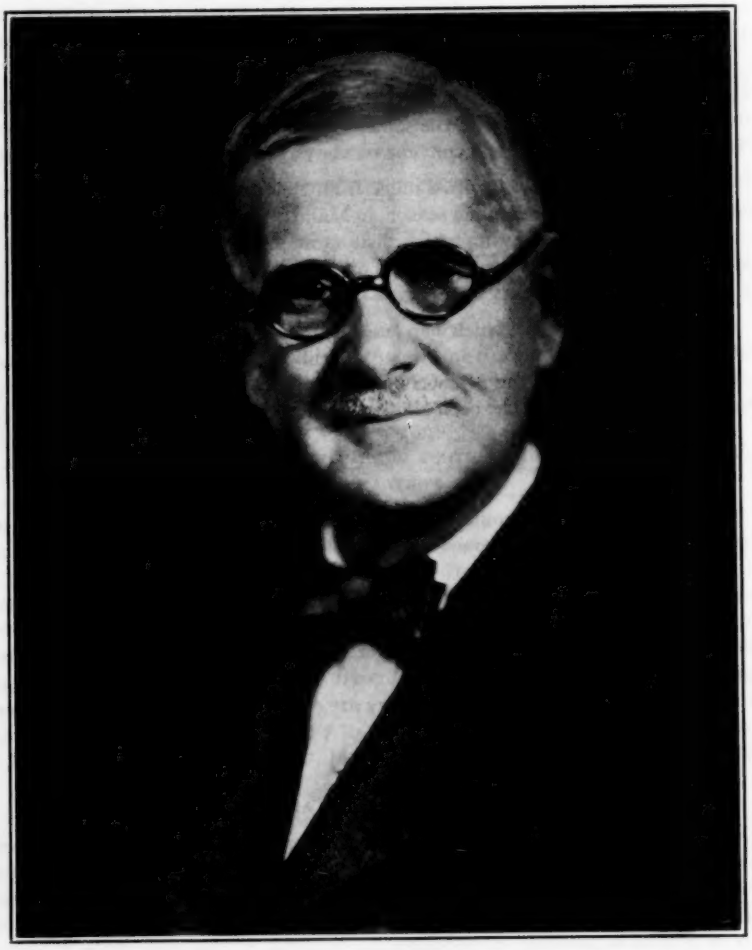
The Plant Science Seminar voted to meet in Boston and will convene at the Massachusetts College of Pharmacy during the week preceding the A. PH. A. Convention—the exact dates for the meeting and tentative program will be announced later. The program for Seminar week includes trips to the Arnold Arboretum, America's greatest garden of trees and shrubs, the Gray Herbarium and University Gardens of Harvard University and the Glass Flower Collection in Agassiz Hall, Cambridge. All members of the AMERICAN PHARMACEUTICAL ASSOCIATION who are interested in Botany, Pharmacognosy or Plant Chemistry are cordially invited to attend the Seminar and participate in its activities. Members of the Seminar are requested to send the titles of their subjects to the Secretary Otto P. M. Canis, Ozone Park, Long Island, N. Y.

NOTICE TO SECTION OFFICERS AND COMMITTEES.

Section officers should at once outline the programs of the respective Sections, so that papers may be solicited and the authors given ample time for their preparation. It is hoped that all Sections will adopt the plan of the Scientific Section and Section on Practical Pharmacy and Dispensing of having abstracts of the papers accompany the papers or sent in in advance, so publicity can be given to the work of the Convention. No one is in better position to prepare the abstracts than the authors and this will prevent misinterpretation by reporters of the daily press. Protection against loss is afforded by mailing duplicates of the papers and of the abstracts to the JOURNAL office, 10 W. Chase St., Baltimore, prior to the meeting.

Committees, also, should make preparations for the meeting. Five months will pass very quickly—it seems only a little while since we met in St. Louis and, according to the calendar, this is a longer time than the period intervening between now and the time of the Maine meeting.

Remember the time and place, Portland, Maine, during the week of August 20th.



D. F. JONES.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVII FEBRUARY, 1928 No. 2

DAVID FRANKLIN JONES.

David Franklin Jones, President-Elect of the AMERICAN PHARMACEUTICAL ASSOCIATION, was born of Welsh parentage in 1869, on a farm near Sparta, Wisconsin. His early education was obtained in the schools of that city. After a few seasons of teaching, he was graduated with honors from the Pharmacy courses of Northwestern University.

In 1894, after graduation, Mr. Jones came to South Dakota and served for a time as instructor in the Pharmacy Department at State College; he purchased the Marshall Drug Company of Watertown, and has since operated continuously the D. F. Jones Pharmacy. The business is founded on individuality, wherein professional ethics are strictly adhered to—it is an establishment which offers a distinctive prescription and physicians' service, with facilities for the manufacture of materials not readily available otherwise.

The President-Elect is a firm believer in the value of association work and in the worth of national conventions. During his thirty years of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION he has held several offices, including that of Vice-President. He was also one of the committee of three that some years ago outlined and established the National Association of Boards of Pharmacy.

He has served as President of the South Dakota Pharmaceutical Association; as a member of the State Board of Pharmacy for fifteen years; he figured prominently as Chairman of the Drug Standards Commission and has thrice represented his State as delegate to United States Pharmacopœial Conventions.

In June 1927, the University of South Dakota conferred an honorary degree of Doctor of Science upon Mr. Jones "in recognition of his interest in the intellectual, scientific and professional advancement of the State." He is an honorary alumnus of the Philadelphia College of Pharmacy and Science, and a charter member of the South Dakota Academy of Science.

Mr. Jones has always taken an active part in community life; for many years he has been a trustee of Dakota Wesleyan University of Mitchell.

He was married to Mabel E. Coe, of Baron, Wis., in 1897; their son, David, Junior, is a student at the University of Alabama.

Mr. Jones is possessed of the vision, experience and wide acquaintanceship essential to the position which he has been called upon to fill.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

PHARMACY'S PART IN LAWS APPLYING TO THE DRUG BUSINESS.

IN ALL court decisions in which restrictive measures that apply to the sales of medicine are involved there is a question of safeguarding the life and health of the citizens; hence, aside from provisions which give such protection through qualified pharmacists it is of equal importance that druggists be observant of their professional obligations and desirous of serving. The progress of the drug industries depends not only on the regulation of its trade practices, reasonable observation of its codes of business and professional ethics, but on bringing into active coöperation all of its divisions.

President Sewall Cutler, of the National Wholesale Druggists' Association, embodied these thoughts in his New Year Message: "We should recognize that collective effort may accomplish much where individual effort fails. Collective effort never meets its greatest success unless every individual in the collection or organization does his part." We should encourage more active coöperation, harmony and friendly intercourse between members of different associations of the drug trade and of pharmacy and more constructive and instructive work within these associations. Speaking further for the N. W. D. A., he said, "We should ascertain all facts involved and utilize every legal means in our possession to protect the retail druggist in his competition with those outside interests which are encroaching on the fields of his activity in a way that is injurious and detrimental to the progress of fair trade practice."

Comment has been made in previous issues of the JOURNAL relative to sales of medicines by others than pharmacists; the guiding thought in the decisions bearing thereon has been of late, if not in the past, the greater safety and better service rendered by those qualified by education and training. Unless there is more involved than handing out a package, more than an ordinary sale wherein one salesman has no better understanding than another of what the package contains, the decisions have not favored restriction, but in cases wherein knowledge gave the public protection the decisions rendered have, by inference if not otherwise, stated the importance of pharmaceutical service.

This was more fully expressed in the decree of the District Court of the United States for the Eastern District of Pennsylvania in the case contesting the constitutionality of the Pennsylvania Drug Store Ownership Law. It is not the intention to comment at great length on the decision but to bring out the essence of the views expressed relative to the rights of the people in restricting ownership of drug stores to those who have more than a profit interest because of their professional allegiance.

The court discussed at length the question of the relation of ownership to the public interests and in rendering its decision stated that "there enters into every business the two motives of a wish for profit and a sense of duty obligation toward those with whom the management deals. When these are joined the latter (motive) operates to some extent; the moment they are separated the

former is in sole control. This thought deals with the relation between things which should be joined and the public policy of not permitting them to be separated. There is likewise the thought of things which should not be joined."

The opinion of the Court is based on the drug business in which pharmacy has a part; in some instances this may not be large, but it is important because of the professional service rendered.

Good business methods assure patrons of fair dealing; professional services imply that their well-being is given due consideration—they are equally important and, in the writer's opinion, the individual contact and interest of the owner of a drug business is as important for the public as it is for the trade and profession.

—E. G. E.

THE NEW SYSTEM OF BUSINESS AND PROFESSIONAL SERVICE CALLS FOR RELATED COÖPERATION OF ORGANIZATIONS.

FROM time immemorial trades and professions in their progressive march have been subjected to changes and those engaged in their promotion have adapted themselves to them and studied methods for the solution of problems presented by the new order of things. To-day we speak of newer competition to which must be applied new coöperation.

In pharmacy individuality will continue to have an important part; however much the public seeks newer methods of distribution there comes ever and again to them the realization that faith and confidence in the pharmacist, as well as in the members of other professions, cannot be satisfactorily replaced.

In *N. W. D. A. Bulletin* No. 148 "The Answer to the New Competition" by O. H. Cheney is reprinted from *Nation's Business;* it is well worth reading and study. The author asks "What does the public think of consolidations and big business?" He answers—"Public opinion is very mixed and would reveal strange inconsistencies if analyzed; to that extent, at least, does our Government represent our citizenry."

"But what will become of little business? Will all business men and their sons forever on have to be employees of great corporations? Will all opportunity and initiative hereafter go unrewarded by personal success?" The author answers—"I do not fear such developments. This country's great prosperity has been built by qualities and opportunities which will endure. One reason is that there will always be little businesses for those who want them and can run them efficiently. Another reason is this: It is true that, in general, the big businesses of the past were made by men and that in the newer cases it was the big businesses which made the men—but they are men! And the bigger the business, the bigger the opportunities."

Enlarging somewhat on the preceding comment as it applies to pharmacy: The progress of the drug activities depends on adequate education so as to make pharmacy a growing service for the health of the people, the regulation of its trade practices, reasonable observation of its codes of business and professional ethics and on bringing all of its divisions into active coöperation.—E. G. E.

THE RELATIONSHIP OF MEDICINAL WHISKY TO THE NUMBER OF DRUG STORES AND THE REGISTRATION IN SCHOOLS OF PHARMACY.

UNDER the above caption a very interesting and timely statistical article has been prepared by Prof. J. G. Beard—former Chairman of the Section on Education and Legislation of the AMERICAN PHARMACEUTICAL ASSOCIATION—and is printed in this issue of the JOURNAL.

Quoting the author "it hardly seems possible from this data to establish the point that the sale of medicinal whisky has any particular bearing either upon the growth of the drug stores or the number of persons studying pharmacy."

Attention is called to the final paragraph of the article in which the author frankly states his position on the question of sales of medicinal whisky in drug stores.

The position of the AMERICAN PHARMACEUTICAL ASSOCIATION on the dispensing of medicinal whisky is clearly set forth in Resolution No. 18 of the St. Louis meeting, printed on p. 888 of the September JOURNAL, A. PH. A. for 1927.

U. S. PHARMACOPŒIA X IN SPANISH.

Secretary William B. Day, of the Board of Trustees of the U. S. Pharmacopœial Convention, has advised that the Spanish Edition of the United States Pharmacopœia, Tenth Revision (Farmacopea de los Estados Unidos de America, decima revision decenal) has recently been published by the Board of Trustees of the United States Pharmacopœial Convention and is obtainable from the agent, The International Trade Papers, Incorporated, 2 West 45th Street, New York City, N. Y. The price is $6.00.

DR. JOSÉ GUILLERMO DIAZ.

The translation has been made by a Committee from the University of Havana (Havana, Cuba) with the coöperation of Dr. José Guillermo Diaz, who prepared and translated the U. S. P. VIII and the U. S. P. IX into Spanish. The translating committee consisted of Dr. G. Garcia Morales, *Chairman;* Dr. Mesa de Ponce, *Secretary;* Dr. Sarah Bustillo and Dr. Rosa T. Lagomasino.

The United States Pharmacopœia has been adopted as the official Pharmacopœia for the Republic of Cuba and is extensively used throughout Central and South America and Mexico. The completion of this Edition is welcomed by the pharmacists of these countries and adds to the service rendered by the U. S. Pharmacopœial Convention.

SCIENTIFIC SECTION

THE AIMS AND METHODS OF MODERN PHARMACOLOGY.

BY DAVID I. MACHT.

(*Continued from p. 17, Jan.* JOUR. A. PH. A.)

I now come to the consideration of the highest goal of the pharmacologist, namely, the study of *Chemopharmacodynamic Relations*. This is a goal toward which every expert pharmacologist strives to approximate but unfortunately which very few succeed in approaching, and is indeed one from which many a pharmacologist has unwaringly receded. Inasmuch as the chemistry of digitalis bodies has not yet been solved a discussion of such relationships in connection with that drug cannot be made. A few general remarks on the subject, however, may not be out of place. The subject of relationships between chemical structure of various substances and their physiological effects is a fascinating one but is one which has yet been developed to a very limited extent. Large treatises have been published on the subject notably those by Fränkel and Oswald. These have grown in volume with every new edition but an examination of the same reveals that they are for the most part but compilations of many unrelated observations obtained by various investigators which the writers have attempted to correlate according to their fancy. Of course, there are quite a considerable number of definitely established chemopharmacodynamic relationships in pharmacology, but on the whole any attempts at broad generalization in this field are premature and the work along this line by careful pharmacologists has confined itself to chemopharmacodynamic and chemotherapeutic studies within definitely established limits, and with chemical compounds the structure of which is generally thoroughly known. We are not in a position in pharmacology to go so far as physicists used to go in our student days when they delighted in expressing every physical phenomenon by means of formulas in terms of C. G. S. units. Whenever I speak on this subject I cannot refrain from alluding to two anecdotes which serve admirably to warn the uninitiated of the pitfalls in this fascinating field of research.

A young man who had been drafted in the chemical warfare service, on returning to America after the war decided to go into pharmacology. This ambitious young gentleman came to the pharmacological laboratory of Johns Hopkins University to consult with some of the men concerning the following wonderful idea which he conceived. He wanted "to study the relation between chemical structure and pharmacological action." On being asked as to what particular group of compounds he was especially interested in, he replied that his purpose was to take up the study of all organic chemicals that he could pick up in the chemical museum for this purpose. It is ten years since this young man made the above remark and I am sure that his ambitions have since then become more modest. Indeed I am not well aware of his having contributed anything of importance to the subject of chemopharmacodynamic relationships at all. The trouble with him was that instead of confining himself to an intensive study of a small group of chemically related substances he wanted to tackle the correlation of the whole field of chemistry with the whole field of physiology.

In another case a group of investigators undertook to study the relative *toxicity* of a large number of organic and inorganic compounds and to do so they chose for their criterion the killing power for tadpoles. An enormous number of experiments were performed on tadpoles and on the basis of the figures thus obtained they constructed a mathematical formula purporting to convey the relationship between chemical structure of the substances examined on the one hand and the killing power for tadpoles on the other. I am not prepared to question the validity of the formula thus built up from the tadpole experiments although from the pharmacological point of view it is very doubtful that the same formula could be applied to express the toxicity of entirely unrelated chemical compounds. The investigators in question unfortunately went further and actually claimed that the toxicological data obtained from tadpoles and the mathematical formula constructed therefrom could be applied to other animals and even to human beings. Here is another excellent illustration of an insidious trap into which the inexperienced pharmacologist is liable to fall, unless he is thoroughly trained not only in chemistry but also in the biological and medical aspects of such experimentation. Even though a mathematically correct formula could be constructed dealing with the relationship between the chemical structure of any group of compounds and their toxicity for tadpoles, such a formula would only hold good for tadpoles, and even then for only the *particular species of tadpoles* on which the experiments were performed. To apply the same formula to other genera of animals, would be sheer folly, unless new experiments equally as numerous be performed on such animals with the same results. This from the pharmacological point of view is very unlikely because every pharmacologist is well aware that differences in their reaction to drugs are shown not only by different families of animals but even by different species of the same family. To give a concrete illustration of the complexity of this subject I may be permitted to report the findings obtained by me and my co-workers in connection with a toxicological study of certain mercurated fluorescein derivatives.

We have been interested in studying the toxicity of the following compounds. Oxymercuridibromfluorescein commonly known as Mercurochrome-220 Soluble and containing theoretically 26.6% of mercury, dimercury-dioxy-dibromfluorescein containing theoretically 43.2% of mercury, Oxymercurytetrabromfluorescein or mercurated eosin containing 23.18% of mercury, Oxymercurytetraiodofluorescein containing 19% mercury and Oxymercuryfluorescein or Flumerin containing 31.5% of mercury. The toxicity of these compounds was first studied on tadpoles of the frog *rana sylvatica*. This was done by immersing the tadpoles in solutions of the various drugs and noting the killing time. It was found that the relative toxicity beginning with the most powerful of the various compounds was in the following order: Iodo Compound ⟶ Mercurated Eosin ⟶ Mercurochrome ⟶ Dimercury Compound ⟶ Flumerin.

The toxicity of the same compounds determined by intraperitoneal injections into white rats beginning with the most powerful was in the following order: Mercurochrome ⟶ Mercurated Eosin ⟶ Dimercury Compound ⟶ Flumerin ⟶ Iodo Compound.

The relative toxicity for rabbits determined by intravenous injection was in the following order beginning with the most toxic: Dimercury Compound

⟶ Flumerin ⟶ Mercurochrome ⟶ Mercurated Eosin⟶ Iodo Compound.

The toxicity for cats by intravenous injection was of the same order as for rabbits except that it was found that the dimercury compound was extremely toxic for that animal, even more than for rabbits. The toxicity of the above compounds was also studied by phytopharmacological methods on plant protoplasm. This was done on living seedlings of *Lupinus albus* suspended in nutrient Shive solution according to the methods practiced by the author. (7). Such seedlings suspended in solutions of the various mercurated compounds for 24 hours in the dark at room temperature gave the following order of toxicity beginning with the most toxic: Mercurated Eosin ⟶ Mercurochrome ⟶ Dimercury Compound ⟶ Flumerin ⟶ Iodo Compound.

A most remarkable phenomenon was noted in connection with the experiments on living seedlings: namely, the toxicity of the solutions became much greater when the seedlings were grown in them exposed to light and the order of toxicity was changed being as follows: Mercurochrome ⟶ Flumerin ⟶ Dimercury Compound ⟶ Iodo Compound ⟶ Mercurated Eosin.

It is thus evident from the above experiments that the relative toxicity of the various compounds is very different for different plants and animals. Furthermore, it was found that in case of the tadpoles as well as in case of the *Lupinus albus* seedlings the toxicity of the mercurated fluorescein derivatives was greater in the presence of sunlight. A study of the results obtained furthermore revealed another curious observation. It was found that the dimercury compound was extremely toxic to the higher animals, cats and rabbits when injected intravenously and yet the same dimercury compound when injected into the peritoneal cavity of white rats was less toxic than mercurochrome or mercurated eosin. The dimercury compound was also less toxic than some of the other mercurated derivatives when tested on the seedlings both in the dark or in the light. The explanation of this extraordinary phenomenon was not far to seek. When the same dimercurated compound solutions was administered to both rabbits and cats as well as rats by intraperitoneal injection it was not as poisonous as either mercurochrome or flumerin. This was due to the fact that this compound was less penetrating through the tissues and consequently was absorbed with greater difficulty than either mercurochrome or flumerin or mercurated eosin. When injected into the peritoneal cavity the absorption was so slow that the toxic effects came on very slowly and the animal succeeded in getting rid of some of the poison. When, however, the dimercury compound was injected directly into the circulating blood its toxic action on the heart muscle was immediately manifested by the arrest of that organ and death of the animal. This difference in the penetrating power of the various compounds used could be clearly seen by examining the seedlings suspended in their solutions. It was noted, even with the naked eye, that the penetration of the dimercury compound was not as great or as rapid as that of mercurochrome. We further found that when the three mercurated compounds of di-bromfluorescein, di-chlor-fluorescein and di-iodo-fluorescein with the halogens in the resorcin component were studied on gold fish and rats, the index toxicity was again different. These experiments illustrate how many factors may play a rôle in even such a problem as the study of the relative toxicity of a small group of closely related chemical compounds, and which render any sweeping

generalizations concerning the relation of chemical structure to physiological action very risky. All such statements must be based on actual experimental evidence and it is not at all wise to make any greater claims than are actually warranted by one's experiences in this field.

In spite of the difficulties which I have tried to emphasize, the science of pharmacology has been quite fortunate in having discovered a considerable number of important chemopharmacodynamic relationships. I need only cite a few outstanding examples. The Meyer and Overton theory of narcosis is one of the best known generalizations in pharmacology which has been based on an enormous number of experiments with a very large number of compounds. This is a good example of a generalization wide in scope in the chemopharmacological field and for this very reason this theory has not successfully or rather completely stood the test of time, and exceptions and modifications to the original statements of the so-called Meyer-Overton law are cropping up almost every year. A much better example of the classical nature in this field are the studies on cocaine. The chemistry of the cocaine molecule, as is well known to all those here present, has been thoroughly studied and its structural formula has been absolutely established through the work of Willstätter, Ladenburg, Merling, Merck and others. This molecule consists of three components, one of which is a complicated base called ecgonin, the other benzoic acid and the third methyl alcohol. A very careful pharmacological study has been made of the rôle played by each component not only in regard to the local anæsthetic properties of cocaine but also in respect to its delirifacient properties and its action on muscle (8, 9). Following such studies further work was done in regard to simplifying the structure of cocaine-like bodies, at the same time retaining its important therapeutic properties especially as a local anæsthetic. Substitutions were made in place of ecgonin and other components of the cocaine molecule and as a result of such extensive chemopharmacodynamic studies the new local anæsthetic novocaine was synthesized. This discovery as in the case of all such successful outcomes in pharmacological research lead to what we may call researches of secondary degree; in that various modifications of novocaine were put on the market which differed from it only by the introduction of other side-groups. Another classical example of chemopharmacodynamic relationship, is the study of quinine. The chemical structure of this alkaloid has also been definitely established through the work of numerous chemists and pharmacologists, Skraup, Hesse, Claus, Miller, Rohde, Rabe and König. Its molecule was shown to consist of three parts: a quinoline nucleus with a methoxy group in para-position, a so-called loipon component consisting of a piperidine nucleus with two CH_2 groups in bridge position and two connecting side-chains, one having a Vinyl group and the other a H CO H group connected with the quinoline. The brilliant researches of Morgenroth and his pupils in connection with quinine and numerous cupreine alkaloids related to quinine are a very fascinating chapter in modern pharmacology. These authors have shown that by changing slightly the constitution of different cupreine derivatives, various chemotherapeutic agents were produced which exerted specific bactericidal and parasiticidal effects on specific bacteria and protozoa. Another classical example of chemopharmacodynamic relationship are the studies of Ehrlich and his school on various arsenical compounds culminating in the compound 606 or salvarsan.

If I may be permitted to quote still another illustration along this line showing how the discovery of such relationships may result from prolonged and painstaking routine and comparative studies of various chemical compounds, I should cite my humble contributions to the pharmacology of the opium alkaloids. I have been carrying on pharmacological studies on the various opium alkaloids for many years and some ten years ago became especially interested in the peculiar properties of the papaverine group of opium alkaloids which are characterized by their antispasmodic effect on smooth muscle organs and tissues. The alkaloids of the papaverine group are distinguished chemically from the morphine group of opium alkaloids by their containing a double nucleus, one component of which contains isoquinoline the other a benzyl grouping. The morphine alkaloids of opium have an entirely different chemical structure, the molecule being composed of a combination of two very different components namely a phenanthrene group and a piperidine group. Numerous experiments with papaverine and related alkaloids and their decomposition products have led me finally to conclude that its antispasmodic properties resided in its benzyl component. As a result of these studies came the discovery of valuable antispasmodic properties of various benzyl esters which are now familiar to all and are extensively used in medical practice throughout the world (10). Incidentally to the study of the various benzyl esters a pharmacological examination of benzyl alcohol led me very quickly to the discovery of its local anæsthetic properties thus opening up the way to synthesis of a new group of local anæsthetics, much less toxic than cocaine or novocaine. Benzyl alcohol solutions for anæsthesia were found to be at least 40 times less toxic than cocaine (11).

I should like on this occasion to make a preliminary announcement of another discovery, which I have not yet published. I have been carrying on comparative studies concerning chemopharmacodynamic relationships of morphine and related alkaloids. As a result of these studies I have collected undoubtable evidence that the narcotic properties of morphine reside in its phenanthrene component. The piperidine component of morphine I have found played the principal rôle in the action of morphine on smooth muscle, stimulating it. I have dwelt at some length on the problems confronting the broadminded pharmacologist and described the principal lines of inquiry which one must pursue in order to make an adequate study of the pharmacological properties of a drug to the research pharmacologist for the carrying on of original investigations. Let us now consider some other aspects of Pharmacology.

The pharmacologist being able to draw on the store houses of chemistry on the one hand and biology on the other is especially fortunate in having a rich mine to supply him with ore for every conceivable kind of pharmacological and therapeutic research. It is not at all necessary to look for far-fetched and rare subjects to obtain material for original investigations. In pharmacology the investigator can draw first of all on the Materia Medica itself either of the United States or on that of any other country. The pharmacopœias and dispensatories of all nations are abounding in largely unexplored and virgin fields. Many of our most important drugs still require intensive and extensive study from the pharmacological and therapeutic points of view. The very illustration which I have quoted above, namely digitalis, is a very good example. Our knowledge concerning this

drug is more confused at present than it has been twenty years ago because of the many new discoveries in chemistry and physiology. The same is true of almost every important drug in our pharmacopœia. Not only do the principal drugs of our Materia Medica require further research but also many of the so-called obscure and minor medicaments to be found in the medical dispensatory may also yield valuable stuff. Cod-liver oil has been used by the laity and by medical practitioners for the treatment of rickets and malnutrition for many years. With the development of pharmacology some of the cock-sure exponents of that science without further experimental basis were inclined to cast this valuable substance in discard, asserting that cod-liver oil was no more valuable than an equivalent amount of olive oil or other vegetable or animal fat. The recent discoveries concerning vitamines have changed our views entirely concerning the pharmacological and therapeutic properties of this drug, and now on the basis of such studies the pharmacologist goes further and actually *potentiates* his cod-liver oil by irradiating it with a mercury quartz lamp in order to increase the vitamin content.

A second source of available material awaiting pharmacological investigations is, of course, the whole field of organic chemistry. Here again the discriminating pharmacologist must use his wits and experience in the selection of the compounds to be studied. It would obviously be impossible to make a routine examination of all organicals that have been prepared in the chemical laboratories, unless a regiment of pharmacological testers were engaged in examining them in a big factory. Nor is it wise to undertake the study even of a too large single group of chemical compounds without having some special "lead" or as the Germans say "Fragestellung," that is a definite objective. A thorough examination of any large group of chemicals from every pharmacological angle will, of course, in the course of long time lead to some kind of a discovery of interest but such a procedure will be more or less of an accident, and is comparable to the groping of a blind chicken which may occasionally pick up a grain or two. The same may be stated of general floundering about without a definite objective in pharmacological research from the physiological side. The prospects of discovering some definite facts or establishing some chemopharmacological relationships are much greater when the investigator confines himself to some well-defined problem even though it be apparently an unimportant one, because very often the study of such a problem may lead to incidental or accidental questions of much greater interest.

The pharmacologist can approach original research from still another point of view, namely, the therapeutic one. It is here that the investigator trained in medical sciences again scores over his colleagues. The pharmacologist with a medical training, which in the opinion of all leading exponents of pharmacology is absolutely essential, will often think of practical therapeutic problems to be solved in his laboratory. Indeed in my opinion the usefulness of the pharmacologist can be increased manifold through his contact with various clinicians. I for one have collaborated with practically every department of the Johns Hopkins Hospital in investigating the pharmacological and therapeutic aspects of various problems arising in the same. Such a pharmacologist will one day take up a therapeutic problem bearing on internal medicine. At another time he may become interested in the study of anæsthetics, antiseptics or other drugs employed by the

surgeon; at other times again he may collaborate on problems bearing directly on various specialties.

Still another and very attractive store house of material awaiting the alert pharmacologist is the historical one. It is a remarkable fact that almost all of our very important medicaments have had their origin in the remote past and were used by old wives and medicine men. Opium was employed for the relief of pain centuries before Sertürner discovered that it contained the alkaloid morphine. Cinchona Bark was employed by the natives of South America for the cure of ague long before its chemistry or pharmacology was begun to be studied. So with digitalis, so with cocaine and many other well-known drugs. Folk-lore is, therefore, a very large store house of information which can be utilized with much profit by the discriminating scientist who has the gift of separating the grain from the chaff. Only very recently in the past few years a valuable addition to our pharmacopœia was made through a scientific study of a crude Chinese drug, Ma Huang, from which an alkaloid ephedrine has been isolated. Perhaps the most important one source leading to original discoveries in pharmacology, however, is the one which the pharmacologist shares with all other scientific investigators and that is a *systematic and assiduous application* to a careful study of some problem or other, because any such intensive study is bound to open sooner or later new points of view and suggest new problems often of greater importance than the original one. In pharmacology as in other sciences we may well quote the proverb "In all labour there is profit, but talk of lips tendeth only to want." (Proverbs XIV, 23.)

Let us now consider for the moment some of the recent developments in pharmacology. Enormous progress in this science has been made from the time of Schmiedeberg who is generally regarded as the father of modern pharmacology. The advances made in tracing *chemopharmacodynamic relationships* and in chemotherapy may be appreciated by comparing the size of the first edition of Fränkel's Arzneimittelsynthese with the ponderous tome comprising the last edition. Indeed the last edition has become so large that it is unwieldy and unreadable. Numerous facts have been compiled in this work; yet an examination of its contents will soon reveal that after all not so many great contributions of an original character have been made to the subject. Most of the material here found belongs to researches of so-called "second order," that is results of repetitions, amplifications and embellishments, along the several really original lines discovered by the chosen few scientists of the first rank. This will be found to be especially true in connection with studies which have been made concerning hypnotics, local anæsthetics, antiseptics, analgesics and antipyretics. The fundamental discoveries concerning these groups of drugs were certainly the result of brilliant original experimentation; later contributions, however, are simply the grinding out of analogous chemical compounds with slight modifications in their structure. They are mostly new variations of the same old tunes.

During the past decade or more pharmacologists have been giving special attention to the *study of endocrines* and other products of animal origin. The remarkable and brilliant work in this field especially on the hormones of the suprarenal and pituitary glands by Abel and his assistants, the thyroid gland by Kendal and on insulin by Banting, Best, McLeod and Collip, leading to isolation of the crystalline product by Abel are more or less familiar to all and are to be listed

among the great achievements of modern medicine. A third interesting development in recent pharmacology has been the study and greater appreciation of the problem of what may be termed "two or more drugs." It has been found that combinations of two or more drugs administered to animals may produce new and startling effects. Two drugs when given together may produce a simple additive effect. Again such a combination may reveal a *synergistic* phenomenon indicated by the potentiation of the pharmacological action of one drug by others. Thus for instance we have shown that a combination of morphine, the principal alkaloid of opium with small doses of papaverine or narcotine, belonging to the benzyl isoquinoline group of opium alkaloids, will produce a greater analgesic effect than the addition of the two component doses and at the same time such a combination is less depressant to the respiratory center and hence less poisonous (12, 13). The contributions of Prof. Bürgi and Storm Van Leeuwen on this subject of drug combinations are especially noteworthy. One drug may also be influenced by the *previous* administration of another one. The so-called paradoxical phenomenon of Dale in which the pressor effect of epinephrine is reversed after a previous administration of ergotoxin is probably familiar to some of you. A great deal of valuable work has been done in pharmacology of recent years along what I may term *micropharmacological* lines. By micropharmacology I mean the study of minute bits of tissue from various parts or organs of different animals. Such studies have been of great help in establishing for instance the nerve supply of certain organs. A most remarkable illustration may be given from the work of Prof. Hugh H. Young and myself on the physiology and pharmacology of the urinary bladder (14). Differences of opinion have long existed concerning the autonomic innervation of this important organ, and apparently no agreement could be reached on the basis of experimentation performed on various animals with the whole bladder either excised or *in situ*. In making a thorough study of the subject we began an inquiry into the effect of various drugs on bits of tissue from various parts of the same bladder and more particularly a comparative study of the muscle tissue obtained from the fundus of the bladder on the one hand and the *trigonum vesicae* on the other. Here the solution to the puzzle could easily be found. It was noted that the same drugs produced diametrically opposite effects on tissue obtained from the two parts of the bladder. Thus it was found that epinephrine while producing a powerful contraction of muscle tissue from the *trigonum vesicae* produced a very marked relaxation of muscle from the fundus of the same bladder. Again it was found that various drugs of the so-called parasympathetic group affected the fundus and trigonum quite differently. The *trigonum vesicae* muscle did not respond to these drugs (physostigmine, atropine, pilocarpine, etc.) at all, while fundus muscle responded very readily. Much valuable information, some of which necessitates a revision of older ideas, has been contributed of late by studies in *colloidal chemistry* as applied to pharmacology, and in particular by investigations concerning the properties of surface membranes. These obviously play a rôle in relation to the absorption of drugs and toxins. Credit is due in this connection especially to Prof. Handovsky and other pioneers in this new field. Interesting information of clinical value has resulted in the past few years from studies concerning the action of drugs on the psychological functions. This subject to which I have given the name of *psychopharmacology* and which I have been developing

is still in its infancy, but has already yielded valuable information (15, 16, 17, 18). I have been of late especially devoting a great deal of time to a comparative study of the effects of drugs and toxins on animal and plant protoplasm. As a result of these studies a new branch of pharmacology to which we may apply the term of *phytopharmacology* is growing up. Even the few contributions which my collaborators and I have so far made along these lines have yielded extraordinarily interesting and practical results (19). Thus it was found by us that by the use of certain living plant tissues, a number of toxic substances present in blood and other secretions could be experimentally detected, a feat hitherto impossible of accomplishment by ordinary zoöpharmacological methods. In this way I have been able to demonstrate conclusively the existence and to study the properties of a toxin present in the blood serum and other secretions of women at the time of menstruation (20). Similar phytopharmacological methods have been employed by us for the detection of minute quantities of carbon monoxide in the blood (21), and this year I have announced and published some interesting and promising studies concerning the toxin of Pernicious Anemia (22, 23). I have been able for the first time to prove the existence of this toxin, and by phytopharmacological methods I am now able to diagnose this disease, and follow the results of treatment. A new and most valuable contribution of pharmacology in recent years has been the studies of Cushny and others concerning ***optic isomers***. Comparative experiments with various stereo-isomers of different alkaloids have revealed differences quantitative, and sometimes even qualitative, in pharmacological action and curiously enough in most cases it has been the levo-rotatory variety which was found to be the most potent. These studies on optic isomers lead me to speak of another development in pharmacology in which I am particularly interested at the present time and to which I like to apply the term of *photopharmacology*. I am referring to the study of the effects of various radiations visible and invisible, on drugs alone and on their pharmacological action. While the influence of ultraviolet and other radiations on chemical action have engaged the attention of chemists for a long time, the effects of light and other radiations on physiological and pharmacological phenomena have been made a subject of study only in the past few years. Studies on the physiological effects of light have already given us better insight into the properties of certain vitamines and have led to most important therapeutic contributions. Studies on what we may term *photopharmacology* are even more recent than those on *phytopharmacology* but promise to be of no less value. The importance of light and the influence of other radiations both ultraviolet and infra red on the keeping qualities of drugs and on the action of various medicaments on living organisms, plant or animal, cannot be overestimated. We have found for instance that ultraviolet radiations and also X-rays and radium emanations produce most remarkable changes in the potency and keeping qualities of digitalis and other medicaments (24). Even more remarkable have been the studies recently first announced by me and by Dr. W. T. Anderson, Jr., concerning the effects of *polarized light* on various drugs. This work, which has been carried on for several years before we ventured to announce it, has definitely shown that not only the very short ultraviolet radiations can produce photochemical and photopharmacodynamic changes but that even the ordinary longer rays of the visible spectrum when polarized may produce profound photo-

chemical changes in drugs leading to alterations in their pharmacodynamic action (25, 26).

The status of pharmacology in our medical schools will depend largely upon the professors of that subject. The scope of pharmacology as I have outlined it to-day touching upon the physico-chemical sciences on the one hand and on the biological sciences on the other is, of course, co-extensive with practically the whole domain of experimental medicine. It is for this reason, as I have already alluded, that the pharmacologist on the medical faculties is sometimes regarded with considerable jealousy both by the physiologist and the bio-chemist and even by those internists or practitioners of medicine who realize that they must know something of therapeutics in order to ply their art. Enough, however, has been said by me to indicate that the pharmacologist occupies a position in science which cannot be filled by other scientific men. The misconceptions concerning this important subject which are so prevalent in these United States are partly the fault of pharmacologists themselves. While the scientific investigator in this department of knowledge may choose to work on any problem he may wish, the course of the true pharmacologist will always be distinguished by two ear marks. The real pharmacologist never looses sight of the following two facts: 'Tis true that pharmacology is based upon the two foundations of chemistry and physiology, *but* the chemistry in which it is most interested is *primarily Pharmaceutical Chemistry or Chemistry of Drugs;* and the physiology in which it is primarily concerned is *Physiologicol Therapeutics* or the action of drugs for the relief of suffering and cure of diseases.

I began my paper with the statement that pharmacology is simultaneously one of the oldest and one of the youngest of sciences. The antiquity of the subject I think can be gathered from what I have already said. One of the best proofs of its young age at least in this our country can be gathered from an examination of the by laws and constitution of the American Society for Pharmacology and Experimental Therapeutics. This constitution is different as far as I know from that of any other scientific society not only in America but in the whole world, in that it contains the following two paragraphs. Article 3, Section 2, "No one shall be admitted to membership who is in the permanent employ of any drug firm." Section 4 (*b*) "Entrance into the permanent employ of a drug firm shall constitute forfeiture of membership." Whatever may have been the motives of the framers for writing such two clauses into the constitution of a scientific society, one inference which is derived from it admits of little doubt. Such articles reveal a lack of confidence and poise on the one hand and exaggerated self reliance on the other, so typical of youth and immaturity. Or, shall I perhaps say such conduct verily reveals the naiveté of childhood, and the impetuosity of youth, who fired with enthusiasm for newly glimpsed fields, forgets the past, neglects his forebears, exaggerates his capabilities and rushes forward—relying only on himself—to find that in the end he must appeal to others for coöperation and aid. He does not understand that scientists as well as those in other walks of life, depend on other men, and consequently have a duty to fulfill to ply their science or their art or trade not only for themselves but also for the welfare of the public and the State.

I have endeavored to convey to you, as best I could, in my peculiar and humble way, what pharmacology is and should stand for. I know not whether I

succeeded; and therefore will conclude with a quotation from an ancient sage.

Rabbi Tarfon: "'Tis not incumbent on thee to complete the work;
Yet art thou not absolved from doing what thou canst."
(*Ethics of the Fathers, II, 21*)

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CAUSES OF DETERIORATION OF STROPHANTHUS SEED DURING STORAGE.*

BY ELIZABETH PICKERING.

Experimental work being done in these laboratories on tincture of strophanthus brought out the information that a sample of Strophanthus Kombé seed which had originally assayed 120 to 133% U. S. P. deteriorated to such an extent during grinding and storage that at the end of one year it assayed only $37^1/_2$ to $48^1/_2$ U. S. P. strength. Since this deterioration was unexpected and unusual in our experience, a thorough search of the literature was made for the purpose of deter-

* Scientific Section A. PH. A., St. Louis meeting, 1927.

mining, in this manner if possible, the conditions which favor and which inhibit such deterioration.

Tincture of Strophanthus is generally considered to be a very stable preparation. The deterioration of the seed was noted by Baldoni (1) who obtained a beautiful green coloration on treatment of the fresh seed with concentrated sulphuric acid, but less coloration when seeds which had been kept for a long time were similarly treated. Very little experimental work has deen done on the factors determining the stability of strophanthus seed. In the absence of experimental work on this deterioration, a number of causes suggested by published material are listed below.

I. Effect of Light.—In 1911, Danielopolu (2) found that from an exposure, varying from thirty minutes to two and one-half hours, of strophanthin to ultraviolet rays its toxicity was very much lessened. Baldoni (1) has also reported that if light is allowed to act upon the seeds or the sun to shine upon them, the color reaction produced by concentrated sulphuric acid, which is supposed to be indicative of their activity, is weakened. This destruction of the active principle is more noticeable in the embryo than in the endosperm. The latter fact may be of importance in relation to the localization in the embryo of a hydrolyzing enzyme which will be discussed later.

II. Effect of Moisture and Heat.—It is well known that both crystalline and amorphous strophanthin Kombé are hydrolyzed by the action of acid solution and heat into the less active strophanthidin. Brauns and Clossen (3) have reported that by the action of heat on an aqueous solution of crystalline strophanthin Kombé, it undergoes in the absence of acid a change into an amorphous acid strophanthin which has only one-third the activity of the former. Boiling of the solution for fifteen minutes caused a loss of 15% of the activity. They state that a similar, though much slower, change is to be expected in the cold. It is therefore probable that the conditions of moisture under which the crude drug is stored will have considerable bearing on the reduction of the strophanthin content.

III. Effect of Molds.—Brauns and Clossen (3) have also reported that a 1:2000 aqueous solution of crystalline strophanthin Kombé kept for two weeks at room temperature showed the growth of mold and the loss of 50% of its activity. The extent to which the crude ground seed is protected from inoculation with molds and from conditions favorable for their growth during storage is therefore of probable importance.

IV. Effect of Enzymes.—It has been reported that the decreased toxic effect of strophanthin Kombé when given orally is due to the action of the digestive enzymes. Holste (4) found that it is only slightly decreased by a three and one-half hour exposure to pancreatin. It has recently been contended that the destruction of strophanthin Kombé in the digestive tract is due not to the presence of enzymes but to the presence of hydrogen ions in the gastric juice (5).

It has, however, been definitely shown that certain vegetable enzymes are capable of decomposing strophanthin. Miyadera (6) found that by previous mixture of spinach secretin with strophanthin the occurrence of the systolic heart cessation following administration was very definitely postponed. He ascribes this to an antitoxic action of the secretion on strophanthin. It seems probable that the results were caused by destruction of the strophanthin by enzymatic action

of the secretion. Tocco-Tocco (7) isolated from the cortex and embryo of strophanthus seeds, a substance which after 24 hours action on strophanthin at 30° caused the loss of the green color reaction with sulphuric acid. This substance was destroyed by heating the seeds at 100° for one-half hour. It was not present in the endosperm of the seed. Jacobs and Hoffman (8) have obtained from *Strophanthus Courmontii, Strophanthus eminii* and from *Strophanthus Kombè* seeds an enzyme which they have named strophanthobiase. This enzyme is capable of hydrolyzing *K*-strophanthin into cymarin and *d*-glucose, to the extent of 79% in 42 hours, 82% in 50 hours and 88% in 66 hours. From this work it seems probable that under certain conditions of storage the strophanthobiase which is present in the cortex and embryo of Strophanthus Kombé might cause considerable destruction of the strophanthin content of the seeds.

V. Effect of Acids.—As was stated above under the *Effect of Enzymes*, the hydrogen ions are capable of hydrolyzing both crystalline and amorphous strophanthin Kombé chiefly into strophanthidin which has only one-tenth the toxicity of the original strophanthin (3). All of the mineral acids and many of the organic acids, with the exception of carbondioxide, hydrolyze strophanthin even in the cold (9, 10). Hydrolysis of the strophanthin content of the crude drug may result from the action of organic acids liberated by the decomposition of the organic matter of the seeds.

This material covers all the suggestions made in the literature as to the deterioration of strophanthin under conditions such as might occur in the storage of the crude drug, and all the information which was found on the deterioration of strophanthus seeds. The crude drug should therefore be protected from light, moisture, heat, and so far as possible from inoculation with mold spores.

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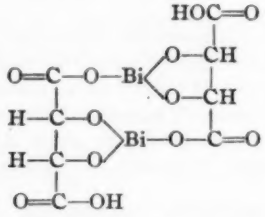
ON THE COMPOSITION OF A SERIES OF BISMUTH SODIUM TARTRATES.

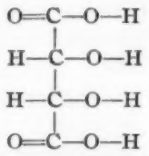
BY W. F. VON OETTINGEN AND Y. ISHIKAWA.*

Warren's review of the commercial bismuth tartrates shows that these vary greatly in composition, the bismuth content ranging from 30 to 75 per cent. The structural formulas suggested for them are not always convincing. We were moved to the attempt to throw some further light on one of these compounds, as prepared by the Fabrègue method, because its chemical and clinical properties differed from those of the citrate prepared by the same method, so as to suggest a different structural relation of the bismuth. We therefore aimed to control and to study, step by step, the reactions of the Fabrègue method for the tartrate, as we had done for the citrate. The preparation of the water soluble bismuth sodium tartrate, as that of the citrate, which is described in a previous paper, involves two phases: first the preparation of the water-insoluble bismuth tartrate and second that of the water-soluble bismuth sodium tartrate.

In the preparation of the bismuth tartrate with the Fabrègue method, 100 Gm. of bismuth nitrate are dissolved in 200 cc. of glacial acid, diluted with 500 cc. of water and mixed with a solution of 97 Gm. of sodium tartrate in 500 cc. of water. A white precipitate is formed which settles slowly on standing. This precipitate is collected on a Buchner funnel and carefully washed with water. The washing is best done by removing the residue from the funnel, re-suspending it in water and filtering it again. During the second washing the precipitate distinctly alters its character to a syrup-like consistency, which changes again on further washing, so that finally a chalky powder remains on the funnel. The washing should be continued until the filtrate is free from acetic acid. The final product is washed with alcohol and ether and dried at 80° C. It represents a fine white powder which is insoluble in water but which is able to absorb considerable amounts of water until it is transformed into a homogeneous magma. The dry powder was analyzed and found to contain 58.3% of bismuth, which corresponds closely to the theoretical value of 58% of a compound $C_4H_6O_{12}Bi_2=744$ of the following structural formula:



In order to save space the formula of tartaric acid:



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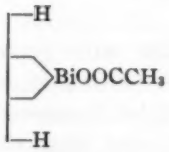
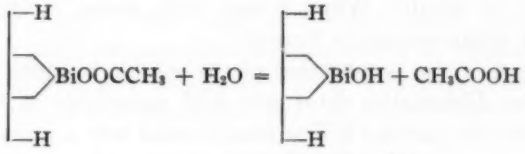
will be given by the figure in which the different H atoms will be replaced as needed.

The changes of the original white amorphous precipitate to a syrup and then to a magma, during the washing, suggest chemical changes. It appeared likely that first an aceto bismutho tartaric acid $C_6H_7O_8Bi = 416$



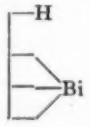
(Formula I)[1]

is formed which is decomposed by hydrolysis during the washing. The isolation of this compound was attempted by avoiding the water as much as possible; namely, by mixing a solution of 50 Gm. of bismuth nitrate in 100 cc. of glacial acid with a solution of 48.5 Gm. of sodium tartrate in 100 cc. of water. The white precipitate was collected on the Buchner funnel, washed with 25% acetic acid to remove the excess of the tartrate, and with alcohol to remove the acetic acid; then it was dried and analyzed. It was found to contain 50.7% of bismuth and 15% of acetic acid, values which are very close to the theoretical values of 50.2% of bismuth and 14.4% of acetic acid required by a compound of the assumed formula. The conversion of this aceto bismutho tartaric acid into the bismutho tartaric acid which is assumed to take place by hydrolysis may be illustrated by the following equation (*a*):



(Formula II.)

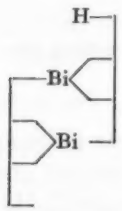
This compound (Formula II) cannot be isolated, because like other bismuth hydroxide compounds, it splits off water during the drying with the formation either of a monomolecular anhydride of the type



(Formula IIIA.)

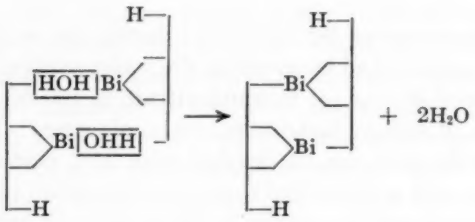
or a bimolecular anhydride of the type

[1] All the formulas are tabulated in the Summary.



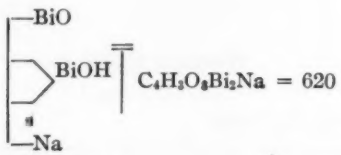
(Formula IIIB.)

Since the two compounds have the same percentual composition, they cannot be identified by analytical means. However, some observations in the second part of the preparation, which will be discussed later, seem to indicate that it is probably IIIB which is formed, and that the reaction takes the course of equation (*b*):



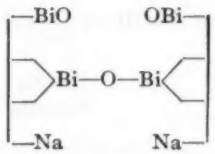
We believe that this compound (IIIB), which might be considered as dibismutho ditartaric acid, represents the final product with the Fabrègue method. It contains 58.3% of bismuth which corresponds closely to 58% of bismuth, the theoretical value of the formula discussed. It represents a white powder, insoluble in water and soluble in alkali. When mixed with water it absorbs considerable quantities before a white magma is formed.

The second part of the preparation of the soluble bismuth sodium tartrate is the solution of the dibismutho ditartaric acid anhydride in sodium hydroxide. For this purpose the dry powder is first transformed into a magma by the addition of water, and then dissolved by the gradual addition of normal sodium hydroxide solution. When just sufficient alkali has been added to secure a solution, a turbidity forms on standing, but clears again on adding a few drops of alkali. When the whole material has been dissolved, the bismuth sodium tartrate is precipitated with alcohol, filtered, washed and dried. Different lots of this compound contained from 67 to 69% of bismuth; but usually about 68.5% of bismuth and 3.8% of sodium. The lower content approaches the 67.4% of bismuth required by Formula V:



(Formula V.)

but the usual composition corresponds to 68.5% of bismuth and 3.8% of sodium required by Formula VI.

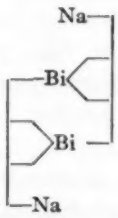


(Formula VI.)

which may be considered as a bimolecular anhydride of Formula V.

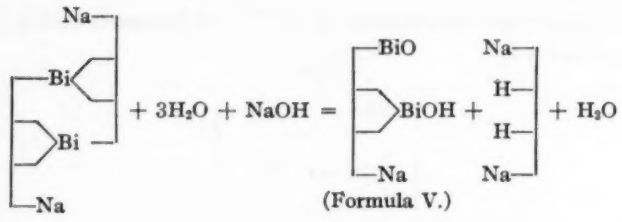
In naming these compounds, the BiO group connected with the carboxyl (end) groups of the tartaric acid will be called "bismuthyl" group, to correspond with the nomenclature of the corresponding bismuth citrates, while the BiO group attached to the (central) hydroxyl groups of the tartaric acid radical will be designed as "bismutho" group.

As it was found that the dibismutho ditartaric acid anhydride dissolves more readily in sodium hydroxide if it was not first suspended in water, this procedure was chosen in a number of experiments, but it was found that the compound precipitated by the addition of alcohol gave always very low analytical values in the range of 60 to 62% of bismuth. As explanation of this finding, it seemed possible that the dibismutho ditartaric acid was not hydrolyzed, but that only the corresponding sodium salt was formed besides a certain amount of bismuthyl bismutho sodium tartrate (Formula V). In an attempt to isolate this unhydrolyzed compound, 30 Gm. of the dibismutho ditartaric acid (Formula III) were very carefully ground in a mortar with 5 cc. 10 *N* sodium hydroxide, until after one and a half hours a homogeneous glassy magma resulted. The addition of alcohol gave a white amorphous precipitate which, after washing with alcohol and drying, was found to contain 54.9% of bismuth and 6.1% of sodium. This corresponds very closely to 55.3% of bismuth and 6.0% of sodium, the theoretical values of a compound $C_8H_4O_{12}Bi_2Na = 756$ of the formula:



(Formula IV.)

This compound might therefore be considered as the intermediate product. It also supports the assumption of the formula of the dibismutho ditartaric acid anhydride Formula IIIB, proposed in the first part. We may assume that by complete hydrolysis by water in the presence of one molecule of sodium hydroxide, the final product, the bismutho monosodium tartrate is formed, corresponding to the equation (*c*):



(Formula V.)

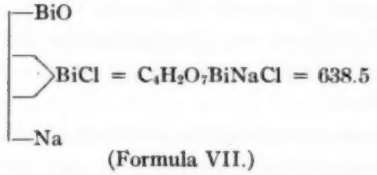
During the drying two molecules of this compound loose one molecule of water, forming a bimolecular anhydride, namely the anhydride of dibismuthyl dibismutho disodium ditartrate with a bismuth content of 68.5% and a sodium content of 3.8%, Formula VI. The final product as obtained conforming to equation (*c*) is a gelatinous mass which filters only very slowly. After washing with alcohol and ether and after drying, it represents an amorphous mass which can be ground in the mortar to a white slightly yellow powder. This change induces us to believe that the original compound is represented by Formula V, and contains a Bi(OH) group, and therefore may be considered as a bismuthyl bismutho sodium tartrate; and that the change, during the drying, is due to the formation of a bimolecular anhydride of the structure and composition given in Formula VI. The formation of sodium tartrate which is assumed by equation (*c*) has been demonstrated by the isolation of considerable amounts of this compound by fractional crystallization.

The formulas of the different bismuth tartrates, as we developed them in the course of this investigation, remain somewhat insecure, as we are dealing with amorphous or even gelatinous substances which are difficult to obtain in pure condition, especially as they are all more or less apt to change their character during the washing and drying processes. We found that the correct analytical values for the bismuthyl bismutho sodium tartrate (Formula V) and the anhydride dibismuthyl dibismutho disodium ditartrate depend largely on three factors: (1) these values become too low when inadequate amounts of water are used for the solution of the dibismutho ditartaric acid in sodium hydroxide, which causes, we believe, an incomplete hydrolysis. (2) low values occur also when too much alcohol is added for the precipitation, by which some sodium tartrate is also precipitated; in this case the total weight of the final product is rather high. (3) With the addition of a large excess of sodium hydroxide, the preparation is partly decomposed with the formation of another compound with a higher bismuth content.

The anhydride of dibismuthyl dibismutho disodium tartrate (Formula VI) is easily soluble in water. A 10% solution has a p_H of 8.4 and is therefore rather alkaline. When the p_H is gradually lowered by the addition of $N/10$ HCl to a p_H of 7.6, a slight turbidity may be observed which gradually increases with increasing acidity. When the bismuth tartrate is precipitated with alcohol from such a partly neutralized solution, it is insoluble in water. We may therefore assume that the alkalinity is a property of the anhydride of the dibismuthyl dibismutho disodium ditartrate itself.

In aqueous solutions this compound probably contains a hydroxyl group as in Formula V, for it forms precipitates with alkali salt, such as sodium chloride,

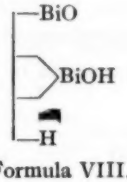
nitrate and others. The chlorine compound was prepared by mixing equimolecular quantities of solutions of the tartrate (Formula VI) and sodium chloride, and analyzed after washing with alcohol and drying. It was found to contain 65.6% of bismuth, 4.0% of sodium and 5.5% of chlorine. This corresponds to a compound with the formula:



(Formula VII.)

which has the theoretical values of 65.4% of bismuth, 3.6% of sodium and 5.2% of chlorine.

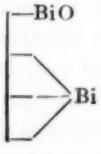
As it was observed that a preparation of the anhydride of the dibismuthyl dibismutho disodium ditartrate (Formula VI), which was completely soluble when freshly precipitated, became less soluble after having been dried on the Buchner funnel by sucking a current of air through the precipitate for many hours, and could then only be brought into complete solution by the addition of a few drops of $N/10$ sodium hydroxide, the influence of carbonic acid on the bismuth sodium tartrate was investigated. By saturating a solution of bismuth sodium tartrate (Formula VI) with carbon dioxide, a white precipitate is formed which is insoluble in water, and which after washing and drying consists of a white powder. This compound does not evolve carbon dioxide with acetic or hydrochloric acid and hence cannot be considered as a carbonate. Samples were found to contain 72.1 to 73% of bismuth and traces of sodium. The fact that the product recovered in this way was found to be free of carbon dioxide, suggested that the sodium was replaced by hydrogen with the formation of a compound $C_4H_4O_8Bi_2$ = 598 of the type:



(Formula VIII.)

which may be considered as a bismuthyl bismutho tartaric acid.

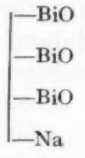
We believe that by the drying process the compound loses one molecule of water with the formation of an anhydride, bismuthyl bismutho tartaric acid anhydride $C_4H_2O_7Bi_2$ = 580 of the formula:



(Formula IX.)

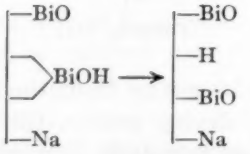
which contains 72% of bismuth, which value corresponds to those found by analysis. When this compound is redissolved in the presence of sodium tartrate with sodium hydroxide and reprecipitated with alcohol from its solution, a compound results which contains after drying 68.3 to 68.5% of bismuth and 3.9% of sodium which corresponds to the theoretical values of the anhydride of the dibismuthyl dibismutho disodium ditartrate (Formula VI), namely: 68.5% of bismuth and 3.8% of sodium. When, however, this solution in sodium hydroxide is affected in the absence of sodium tartrate, a compound results which contains 74.3% of bismuth and 2.8% of sodium.

Compounds of the same composition are formed when the anhydride of the dibismuthyl dibismutho disodium ditartrate is dissolved in water and reprecipitated with alcohol. The formation of this compound is very much favored by the presence of sodium hydroxide and by warming; it is prevented on the other hand by the presence of sodium tartrate. The analytical values of this compound correspond to 74.2% of bismuth and 2.7% of sodium values required by a compound $C_4H_2O_9Bi_3Na = 844$ of the following structure:



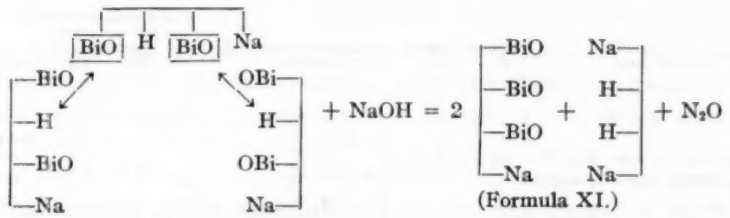
(Formula XI.)

We can only give hypothetical assumptions for the mechanism of this transformation as we have been unable so far to isolate intermediate products. By fractional precipitation with alcohol the bismuth content is gradually decreased and the last fraction contains practically pure sodium tartrate. The reaction might be explained as follows: It may be assumed that under the influence of the alkali on the bismuthyl bismutho tartrate (Formula V), the bismutho group containing the BiOH complex is transformed into a BiO complex while the hydrogen atom migrates to the oxygen atom of the hydroxyl group of the tartaric acid radicle (equation *d*):



(Formula X.)

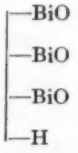
This compound may be considered as a bismuthyl monobismutho sodium tartrate. The two BiO groups of this tartrate (Formula X) replace the hydrogen atoms of the free hydroxyl of the tartaric acid radicle in two other molecules, as indicated by the arrows, and in the presence of one molecule of sodium hydroxide, two molecules of bismuthyl dibismutho sodium tartrate and one molecule of sodium tartrate are formed (equation *e*):



(Formula XI.)

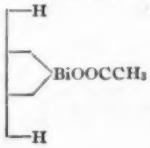
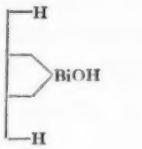
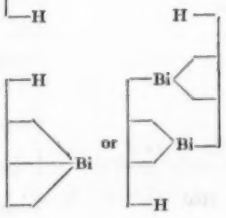
It may be confessed that these assumptions are not based on direct evidence, but it seems the only explanation which would account for the fact that the precipitation of bismuthyl bismutho chloro sodium tartrate (Formula VII) by sodium chloride is prevented in the presence of free alkali, which suggests that the molecular structure of the bismuthyl bismutho sodium tartrate (Formula V) is changed by alkalization to the bismuthyl monobismutho sodium tartrate (Formula X). The bismuthyl dibismutho sodium tartrate (Formula XI) is soluble in water, and as it very easily forms precipitates with alkali salts, we make the assumption that in aqueous solutions the two bismutho groups behave like $Bi(OH)_2$ groups. The compounds resulting from such reactions are, however, of such varying composition, that we are not ready to assign any formula to these compounds.

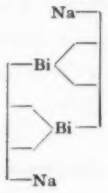
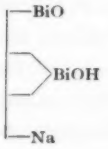
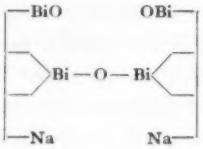
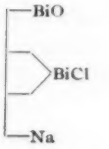
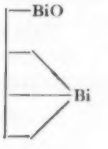
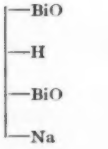
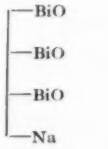
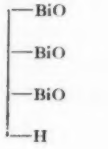
The bismuthyl dibismutho sodium tartrate is also decomposed by carbon dioxide with the formation of the sodium free compound. A specimen recovered in this way was found to contain 76.0% of bismuth and traces of sodium. A compound $C_4N_3O_9Bi_3 = 822$



of the (Formula XII) contains theoretically 76.2% of bismuth and no sodium.

TABLE I.

Formula number.	Preparation.	Per cent found. Bi.	Per cent found. Na.	Assigned structural formula.	Per cent required for assigned formula. Bi.	Per cent required for assigned formula. Na.	Name proposed.
I.	Reaction between $Bi(NO_3)_3$ in CH_3COOH and Na tartrate	50.7	... acet. ac. 15%		50.2	... acet. ac. 14.4%	Aceto-bismutho tartaric acid
II.	Hydrolysis by continued washing with water	Not isolated			....	...	Bismutho tartaric acid
III.	Dehydration by drying in oven at 80° C.	58.3	...		58	...	Bismutho tartaric acid anhydride or dibismutho ditartaric acid anhydride

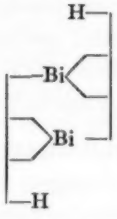
Formula number.	Preparation.	Per cent found. Bi.	Na.	Assigned structural formula.	Per cent required for assigned formula. Bi.	Na.	Name proposed.
IV.	Dissolved in conc. NaOH avoiding excess of water	54.9	6.1		55.3	6.0	Anhydride of dibismutho disodium ditartrate
V.	Hydrolyzed with water in the presence of 1 mol. NaOH	67.3	3.8		67.4	3.7	Bismuthyl bismutho sodium tartrate
VI.	Dried in the oven at 80°	68.5	3.8		68.5	3.8	Anhydride of dibismuthyl dibismutho disodium ditartrate
VII.	V. precipitated with NaCl	65.6	4.0 chlorine 5.5		65.4	3.6 chlorine 5.2	Bismuthyl chloro bismutho sodium tartrate
VIII.	V. decomposed with CO_2	Not isolated					Bismuthyl bismutho tartaric acid
IX.	VIII. dryed in the oven at 80°	72.1	...		72.0	...	Bismuthyl bismutho tartaric acid anhydride
X.	V. dissolved in the presence of alkali	Not isolated					Bismuthyl mono bismutho sodium tartrate
XI.	VI. dissolved in water in the presence of alkali	74.3	2.8		74.2	2.7	Bismuthyl dibismutho monosodium tartrate
XII.	X. decomposed with CO_2	76.0	...		76.2	...	Bismuthyl dibismutho tartaric acid

SUMMARY.

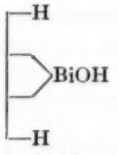
Table I shows the different compounds which we believe to be formed during the preparation of the bismuth tartrate with the Fabrègue method, with the preparation of the soluble bismuth sodium tartrate and a series of derivatives.

CONCLUSIONS.

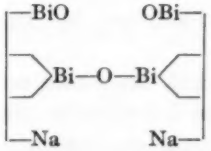
The preparation of the bismuth tartrate by the Fabrègue method passes through different compounds which were isolated and analysed. These are the aceto bismutho tartaric acid and the bibismutho tartaric acid anhydride



which might be considered as a bimolecular anhydride of bismutho tartaric acid, not isolated:

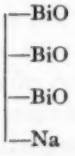


The preparation of the water soluble bismuth sodium tartrate passes also through different phases, the final product being an anhydride of dibismuthyl dibismutho disodium ditartrate of the composition $C_8H_4O_{15}Bi_8Na_2$; the structural formula



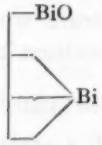
containing 68.5% of bismuth and 3.8% of sodium.

By dissolving the preparation in water in the presence of sodium hydroxide and reprecipitating with alcohol, a compound can be isolated which contains 74.3% of bismuth and 2.8% of sodium which corresponds to the formula $C_4H_2O_9Bi_3Na$ and which might be considered as bismuthyl dibismutho sodium tartrate.



Both preparations are decomposed by carbon dioxide with the formation of the free substituted tartaric acids. By drying in the oven at 80°, the dibis-

muthyl dibismutho disodium ditartaric acid forms the corresponding anhydride, $C_4H_2O_7Bi_2$:



Both preparations, the bismuthyl bismutho sodium tartrate and the bismuthyl dibismutho sodium tartrate form precipitates with alkali salts; and by drying they tend to form condensation products with anhydride formation. In this respect the bismuthyl dibismutho sodium tartrate differs from the dibismuthyl monosodium citrate. We shall report on this difference of the chemical and physical properties of both compounds in another paper.

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NITROSYL CHLORIDE AND KETONES.

BY H. RHEINBOLDT AND O. SCHMITZ-DUMONT.

Under the above-mentioned title E. V. Lynn and Frank Andrew Lee[1] recently published a report, containing a detailed discussion of our investigation upon "*Nitrosochlorination*" of methyl-ketones by nitrosyl chloride.[2] This review prompts the following comments:

By their experiments Lynn and Lee found no chlorisonitroso compounds but only isonitroso compounds. This led them to the conclusion—that the reaction without use of diluting agents would give another result, that it would come to a standstill at the first phase of the nitroso-chlorination.

We have already stated in our previously mentioned communication—that the reaction of liquid nitrosyl chloride on undiluted *acetone* also yielded chlorisonitroso-acetone. We are in a position to confirm this statement by a further experiment with *pinacoline:*

Six Gm. of pinacoline were added to 20 Gm. of liquid nitrosyl chloride, cooled to about —10° C. At first no reaction was evident, but after removing the cooling mixture, a lively reaction took place, with evolution of nitric oxide and hydrochloric acid gas. After the evaporation of nitrosyl chloride, a yellow-colored oil remained, the temperature of which had risen on account of the heat of the reaction. On cooling, the product solidified completely and yielded, after washing with

[1] E. V. Lynn and F. A. Lee, Jour. A. Ph. A. (April 1927), p. 309.
[2] H. Rheinboldt and O. Schmitz-Dumont, *Ann.*, 444 (1925), 113.

cooled carbon tetrachloride, 2.1 Gm. of pure chlorisonitroso-pinacoline melting at 133–134° C.

The opinion of Lynn and Lee—that without using diluting agents the reaction only leads to the isonitroso compounds—is proved by these experiments to be incorrect.

The deviating results of the American investigators are to be attributed to the fact that they used nearly molecular quantities of ketones and nitrosyl chloride, as is evident by their experimental data, while our process of reaction requires a large excess of nitrosyl chloride (theoretical: 3 mol. nitrosylchloride to 1 mol. ketone).

Lynn and Lee also investigated *methyl-ethyl-ketone* and *di-n-propyl-ketone*. That ketones with reactive methylene groups in neighboring position to the carbonyl group do not yield chlorisonitroso compounds, was well known to us. In such cases isonitroso ketones always result: R—CO—C(=NOH).R′. We consider therefore that the formulation: CH_3—CH_2—CO—CH=NOH, given by Lynn and Lee to the reaction product of methyl-ethylketone and nitrosyl chloride, is improbable. The assumption that this substance is *di-acetyl-monoxime* is more likely to be correct, as its melting-point is the same as that given by Lynn and Lee. We have repeated this experiment under the same conditions as described by Lynn and Lee and we have isolated the reaction product melting at 75–76° C., which indeed was identical with di-acetyl-monoxime.

In the conclusions of their work Lynn and Lee summarize their results as follows: "Dialkyl ketones or alkyl aryl ketones react readily with chloride to form isonitroso compounds, with substitution in alpha position to the carbonyl group:

$$R—CO—CH_2.R' \longrightarrow R—CO—C(=NOH)R'$$

When R′ is hydrogen, it then becomes labile enough, under certain conditions, to become chlorinated by the nitrosyl chloride:

$$R—CO—CH=NOH \longrightarrow R—CO—C(Cl)=NOH"$$

This opinion may be changed; as our experiments with aldoximes and ketoximes indicate, that a chlorination does not depend upon the lability of the hydrogen atom R′ but upon the capability of the isonitroso group to react with nitrosyl chloride:

$$R—CH=NOH \longrightarrow R—CH(Cl)—N:O \longrightarrow R—CCl=NOH \quad \text{(aldoximes)}$$

$$R—C(=NOH)—R' \longrightarrow R—C(Cl)(N:O).R' \quad \text{(ketoximes)}$$

In numerous cases we succeeded in isolating chlornitroso compounds from aldoximes.[1] It only depends upon the lability of the hydrogen atom, how easily they convert into the chlorisonitroso compound. Ketoximes lead to stable chlornitroso compounds.[2]

CHEMICAL INSTITUTE,
THE UNIVERSITY, BONN,
December 15, 1927.

[1] H. Rheinboldt and F. Jansen, *Ann.*, 451 (1927), 170. H. Rheinboldt and M. Dewald, *Ann.*, 451 (1927), 273.

[2] H. Rheinboldt and M. Dewald, *Ann.*, 455 (1927), 300.

HYDROGEN-ION CONCENTRATION AND p_H—AN EXPLANATION.*

BY A. LEE CALDWELL.

A brief explanation of the terms "Hydrogen-ion concentration" and "p_H." They cannot be used interchangeably. A means of calculation and diagram illustrating the numerical value of the two terms.

In presenting this paper it is the writer's intention to explain the terms "Hydrogen-ion concentration" and "p_H." Primarily the paper is intended for those uninformed on the subject, and repetition may occur for the sake of clarity and emphasis.

Ions are electrically charged atoms or groups of atoms in solution. Solutions containing hydrogen ions (H^+) or hydroxyl ions (OH^-), therefore, have an acid or alkaline reaction respectively, depending upon which of the two ions are greater in number. In acid and alkaline solutions we have to deal with the dissociation or splitting off of hydrogen (H^+) and hydroxyl (OH^-) groups. This dissociation gives us the active acidity or alkalinity of the solution. Therefore, the term hydrogen-ion concentration is an expression of the amount of ionized or dissociated hydrogen in the solution, and, since the ions carry electrical charges, hydrogen-ion concentration may be measured by electrical methods. Certain indicators have been found that give different shades of colors in solutions differing in hydrogen-ion concentration, and they are very reliable in this measurement.

With considerable effort F. Kolrausch and A. Heydeweyller obtained some very pure distilled water and upon measuring the electrical conductivity found it to have a dissociation constant of 10^{-14}. Water dissociates as illustrated in the following equation:

$$H_2O \rightleftarrows H^+ + OH^-$$

Knowing then that the dissociation constant of water is 10^{-14} (let this be designated as k_w), and known also the manner in which it dissociates, the hydrogen and hydroxyl-ion concentrations may be figured according to the law of mass action. This law may be stated as follows: When the temperature remains constant the product of the active masses on one side of a chemical equation when divided by the product of the active masses on the other side is a constant. Going back then to the above equation and working according to the law just stated we have the following:

$$H^+ \times OH^- = k_w$$
$$H^+ \times OH^- = 10^{-14}$$

From this it is readily seen that $10^{-14} = 10^{-7} \times 10^{-7}$. Therefore the concentration of H^+ is 10^{-7} and OH^- is 10^{-7}, and both concentrations being equal we have the point of neutrality.

WHAT IS "p_H"?

To begin with it may be well to state that "p_H" is not a symbol for hydrogen-ion concentration. The advantages in using the p_H scale, which suggestion was made by Sørensen, are legion and it was readily and universally accepted. The cumbersome mathematical expressions of hydrogen-ion concentration are reduced

* Scientific Section A. PH. A., St. Louis meeting, 1927.

to logarithms, and are easily handled although woefully misunderstood or perhaps not understood at all. Remember then that p_H is a reduction to, or an expression in logarithms of the hydrogen-ion concentration. It is therefore the logarithm of $\frac{1}{H^+}$. In the other words it is the logarithm of the normality of a solution, in regard to hydrogen, divided by the logarithm of the factor for the ionized hydrogen which has previously been measured. For example:

$$H^+ = 3.81 \times \text{an } N/1{,}000{,}000 \text{ hydrogen solution}$$

or

$$H^+ = 3.81 \times 0.000001 \text{ or } H^+ = 3.81 \times 10^{-6}$$

or

$$p_H = \log \frac{N/1{,}000{,}000}{3.81} = \frac{6}{0.5809} = 6 - 0.5809 = 5.4191.$$

Reversing the process it will be seen from the above figures that the hydrogen-ion concentration may be figured easily from any given p_H. Given, for instance, the p_H 8.25, the hydrogen-ion concentration may be calculated as follows:

$$8.25 = 9 - 0.75 = 5.623 \times 10^{-9} = H^+.$$

As has been stated, the dissociation constant of water is 10^{-14} ($H^+ = 10^{-7}$ and $OH^- = 10^{-7}$). Therefore to maintain an equilibrium, if the H^+ increases the OH^- must decrease and conversely so, for the product of $H^+ \times OH^-$ must always equal 10^{-14}. The following diagram will serve to illustrate the dissociation relationship between H^+ and OH^-. The exponents on the reader's left may be considered as p_H and on the right as p_{OH}.

$H^+ = 10^{-0}$	$OH^- = 10^{-14}$
H^+ 1	OH^- 13
H^+ 2	OH^- 12
H^+ 3	OH^- 11
H^+ 4	OH^- 10
H^+ 5	OH^- 9
H^+ 6	OH^- 8
7	
H^+ 8	OH^- 6
H^+ 9	OH^- 5
H^+ 10	OH^- 4
H^+ 11	OH^- 3
H^+ 12	OH^- 2
H^+ 13	OH^- 1
H^+ 14	OH^- 0

Do not overlook the fact that a solution that is p_H 1 is ten times the hydrogen-ion concentration of a solution that is p_H 2, etc.

The methods for determining p_H, both electrometric and colorimetric are widely discussed in chemical and pharmaceutical literature. There are also two standard works on this subject, namely, "The Determination of Hydrogen Ions," by Clark and "Hydrogen-Ion Concentration," by Michaelis (now in English as well as German).

IMPORTANCE OF H-ION CONCENTRATION.

Solutions may contain buffer substances, that is, substances that are not readily changed upon the addition of acid or alkali and act to repress the liberation of free hydrogen or hydroxyl ions. For this reason the addition of 10 cc. of HCl does not assure one that the entire 10 cc. will be dissociated, or that the ionized hydrogen can be assumed without measurement. Acids do not ionize or dissociate to the same extent, and the same holds true for alkalies. Though the total acidity or alkalinity of two $N/10$ solutions, for example, may be the same, the active acidity may not even be approximate. The determination of the H-ion concentration, therefore, is the only accurate guide to the acid and alkaline nature of substances.

The determination of p_H has been applied to practically all fields of industry and research with good results. A few of the varied industries are those of Baking, Canning, Tanning, Candy, Pharmaceutical, Sewage Disposal, Paper, Water Supply, Ceramics, Electroplating, Paints and Dyes, etc.

The pharmaceutical applications of hydrogen-ion concentration are many and deal with the regulation of intravenous solutions to prevent irritation, the preservative action in tinctures, syrups, gland products and the like; and the prevention of discoloration in chemicals and solutions. There are many other possibilities in this field and careful observations in pharmaceutical work may reveal important facts. The writer has examined a great many samples of Sodium Iodide and has found a variation in p_H of from 4.9 to 9.8, the acid samples showing a fairly rapid discoloration after being in solution and standing a few weeks. Sodium Salicylate was found varying from p_H 5.9 to 7.7 and Calcium Chloride from p_H 7.45 to 8.30. In fact, the chemicals purchased from the most reliable sources show wide variations, and only careful examination in regard to H-ion concentration, as well as other details, will result in uniform pharmaceutical products. Some variation must be allowed, since there are such a great number of "outside" influences in the manufacture of chemicals and pharmaceuticals that affect the H-ion concentration. The extremes are the important things to guard against and application of the methods of p_H determination will bring the variations to comparatively narrow limits.

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August 24, 1927.

THE "ASSAY OF A SO-CALLED COD-LIVER OIL EXTRACT" FOR VITAMIN-A CONTENT AND CALCIFYING PROPERTIES COMPARED TO COD-LIVER OIL.*

BY HAZEL E. MUNSELL AND HILDA BLACK.†

The cod-liver oil extract under consideration in this investigation was a commercial product described as an alcohol-soluble extract of cod-liver oil. Its principal use is in pharmaceutical preparations which are offered as substitutes for cod-liver oil. The claims made for such products are that they have growth-promoting and other properties attributable to cod-liver oil.

The beneficial effects derived from the use of cod-liver oil are generally ascribed to its high content of vitamins A and D, which are known to be necessary for growth. An abundance of vitamin A in the diet is also essential for the body to maintain a normal resistance to disease. Vitamin D has been definitely shown to be one of the factors involved in the prevention and cure of rickets. It would seem that any extract of cod-liver oil for use as the sole active ingredient in preparations, having the properties described, should at least be as potent in respect to vitamins A and D as a commercial grade of cod-liver oil. With this in mind the assay of the alcohol-soluble extract of cod-liver oil was undertaken. In order to make results as conclusive as possible all determinations were carried out in comparison with a good grade of cod-liver oil. The method used for determining the vitamin-A content was that described by Sherman and Munsell.[1] At the present time there is no simple clear-cut method of testing a substance for the presence of vitamin D. Following the technique used in other vitamin determinations it would be necessary to have a diet adequate in all food essentials except vitamin D and entirely devoid of this factor.

Vitamin D has been shown to influence bone development and in this way is involved in growth. A test then for the presence of vitamin D in any food might be the growth and bone development made by an experimental animal when the food being tested is fed in addition to a basal diet containing all food essentials except vitamin D.

Although it was recognized that the vitamin-D potency of the alcohol-soluble extract could not be determined absolutely by any technique worked out to date, it seemed feasible to attempt a comparison of the calcium-depositing power of this substance with that of cod-liver oil under like experimental conditions. If under the same conditions the extract showed no greater calcium-depositing power than a good grade of cod-liver oil its vitamin-D content certainly could not be any greater.

EXPERIMENTAL ON VITAMIN-A CONTENT.

Young albino rats reared on a diet composed of two-thirds whole wheat, one-third whole milk powder and salt in the proportion of two per cent of the whole wheat were used for these determinations. At the age of 28–29 days when the

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[1] H. C. Sherman and H. E. Munsell, *Jour. A. C. S.*, 47 (1925), 1639.

animals were weaned they were placed on the vitamin-A-free diet prepared as described by Sherman and Munsell,[1] with the exception that the dried brewery yeast was increased to 10 per cent and the starch reduced to 65 per cent, making the composition of the basal diet as follows: casein (extracted as described[1]), 20 per cent; starch 65 per cent; dried brewery yeast 10 per cent; Osborne and Mendel salt mixture[2] 4 per cent; sodium chloride (table salt) 1 per cent. This amount of dried brewery yeast seems to give better results than the smaller amount of 5 per cent. One group of rats receiving 10 mg. of cod-liver oil extract six times per week was irradiated each day with the light from a mercury vapor quartz lamp at a distance of twenty inches for five minutes. All animals were autopsied for gross pathological lesions, shown by animals confined to a vitamin-A-free diet.

Tables I and II give the results of these experiments. In each litter one or more animals were designated as controls, and these received no additions to the basal ration.

TABLE I.

WEIGHT RECORD OF RATS RECEIVING GRADED PORTIONS OF COD-LIVER OIL EXTRACT AS THE SOLE SOURCE OF VITAMIN A.

Cod-liver oil extract per rat per day, mg.	Rat no.	Weight at 28–29 days, Gm.	Weight at end of fore-period, Gm.	Weight at the end of successive weeks, Gm.								Survival days.
				1.	2.	3.	4.	5.	6.	7.	8.	
	572	56	86	79	80	78	74	71	59			84
	587	56	78	78	77	73	72	70	70	57		91
	599	58	94	104	107	96	75					71
	601	53	57	56	55	53	49	56	51	45		91
0	614	47	58	65	66	59	56	56	49	45		85
	618	42	59	58	58	55	56	46				83
	773	55	73	66	74	66	54					59
	790	60	71	69	68	70	76	61	54			93
											Average	82.1
	578	52	69	73	81	78	70	65	56	51		85
	582	61	85	96	104	99	93	67				80
10	598	59	83	86	92	91	78	77	70	66		89
	786	67	86	104	109	109	91	77				88
											Average	85.5
	579	52	72	74	83	82	80	67	64	55		86
10	583	61	91	105	114	111	107	79	75			81
Rats irra-	597	62	86	99	99	97	71	73	64			83
diated	792	55	54	63	69	71	74	73	59	53		98
											Average	87.0
	772	57	62	73	81	83	83	88	87	66	65	86
	787	62	79	84	94	110	105	85	89	83	71	107
50	775	54	64	80	87	90	89	91	84	80	67	
	791	60	76	93	97	104	104	85	74			95
										Average of 3		96.0
	580	52	75	80	90	95	95	95	95	97	77	
	612	45	56	67	77	77	75	67	71	63	56	93
100	581	52	73	76	86	84	82	80	76	73	64	
	611	46	51	62	69	67	67	66	52			86
									Average of 2			89.5

[1] H. C. Sherman and H. E. Munsell, *Jour. A. C. S.*, 47 (1925), 1639.

[2] Osborne and Mendel, *J. Biol. Chem.*, 37 (1919), 572.

TABLE II.

WEIGHT RECORD OF RATS RECEIVING GRADED PORTIONS OF COD-LIVER OIL AS THE SOLE SOURCE OF VITAMIN A.

Cod-liver oil per rat per day, mg.	Rat no.	Weight at 28–29 days, Gm.	Weight at end of fore-period, Gm.	Weight at the end of successive weeks, Gm. 1.	2.	3.	4.	5.	6.	7.	8.	Total gain, Gm.
	577	54	75	84	96	109	113	117	120	125	129	54
	586	58	67	86	91	96	98	100	109	112	113	46
1	602	49	64	73	81	89	93	99	99	105	113	49
	610	47	67	88	95	98	106	109	119	119	121	54
	776	49	58	56	67	73	75	86	95	106	108	50
	793	52	46	51	55	57	60	69	74	77	88	42

The weight at 28–29 days is the weight at the time the young were weaned and the weight at the end of the foreperiod is that when the reserve body stores of vitamin A are judged to have been depleted and the feeding of the extract or the cod-liver oil was begun. If the animal did not live the full eight weeks, the last figure is the weight of the dead rat. Where no figure is given in the column headed "Survival," the rat lived the full eight weeks and was killed. All of the control animals and those receiving daily portions of the extract, except No. 772 and No. 580, developed the eye disease common to animals confined to a vitamin-A-free diet. The pathological lesions in the rats fed daily portions of extract were in all cases as severe as those of the controls while the rats fed cod-liver oil showed none of these lesions. The curves showing the average gains made by the groups of test animals are shown in Fig. 1.

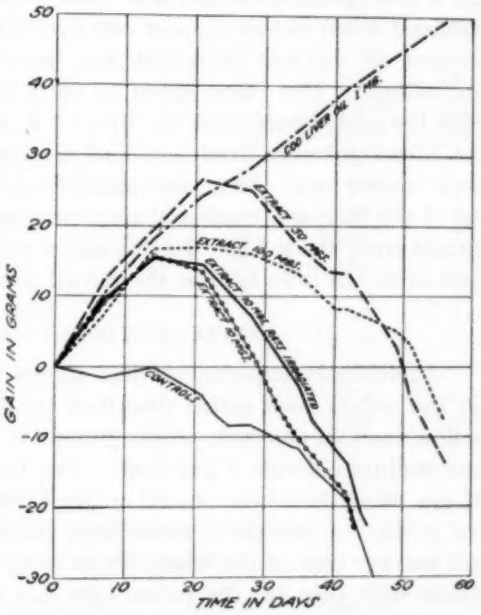

Fig. 1.—Gains in weight made during the test period by groups of rats fed cod-liver oil or the alcohol soluble extract of cod-liver oil as the sole source of vitamin A. Each curve shows the average result obtained from several tests. The quantity of cod-liver oil or extract fed to each rat six times per week is indicated on each curve. One group of rats receiving 10 mg. of the extract was irradiated with the light from a mercury vapor quartz lamp at a distance of 20 inches for 5 minutes, 6 times per week.

From the results of these experiments it is evident that 10 mg. of cod-liver oil extract per rat six times per week did not enable the rats receiving these daily portions to survive an appreciable time longer than those receiving no additions to the basal ration. When fifty mg. and one hundred mg. were used decline and death were slightly delayed, but the time was insignificant when compared with the results obtained with one mg. of cod-liver oil. The animals in this cod-liver oil group not only survived the full eight weeks but made very

nearly normal growth. No increase in growth was noted when the amount of vitamin D was made optimum by irradiating the animals with the light from a mercury vapor quartz lamp. This would indicate that the results are not vitiated by the fact that the basal diet contains little or no vitamin D.

SUMMARY OF VITAMIN-A STUDIES.

The results of these tests show that 1 mg. of cod-liver oil has a higher vitamin-A content than 100 mg. of the cod-liver oil extract. The growth curves indicate, judging by the author's experience in determining the vitamin-A content of foods, that 100 mg. of the extract would contain not more than one fifth as much vitamin A as is present in 1 mg. of cod-liver oil.

CALCIFYING PROPERTIES.

The general method of procedure was to produce severe rickets in rats by feeding a low phosphorus diet and then observe the amount of calcium deposition obtained when cod-liver oil or cod-liver oil extract was added to this diet. The amount of calcium deposited was determined by the line test described by McCollum.[1] The value given to each line test was determined by comparison with the plates published by Bills.[2] A set of these plates was obtained from the Mead Johnson Company and always used for comparison when line tests were carried out. Since microphotographs could not be taken an outline drawing of the bone was made and areas corresponding to the areas blackened by silver nitrate were shaded in. In this way a permanent record of the line test given by each bone has been kept in the record book.

EXPERIMENTAL ON CALCIFYING PROPERTIES.

Preliminary experiments had shown that our rats developed rickets readily on the yellow corn ration described by Steenbock.[3] This ration is made up of yellow corn 76 per cent, wheat gluten 20 per cent, calcium carbonate 3 per cent and sodium chloride 1 per cent. For the tests litters of albino rats 28–29 days of age which had been reared on the same diet were used. Each litter was first fed a diet of one-third whole milk powder, two-thirds whole wheat and table salt two per cent of the whole wheat until they weighed approximately sixty Gm. These were then fed the yellow corn diet for twenty-one days. Such a procedure results in a uniformly severe condition of rickets in rats treated in this way.

At the end of the twenty-one days the rats of the litter were weighed and put in separate cages. One animal was killed either on this day or continued on the yellow corn diet as a control to be killed later. The other rats in the litter were fed the yellow corn diet to which cod-liver oil or cod-liver oil extract had been added. All rats were weighed at weekly intervals and a record of the food intake was kept. At the end of a previously determined number of days called the test period one rat which had had cod-liver oil and one of approximately the same weight which had had cod-liver oil extract were killed. The tibias were removed and as much of the muscle as possible cut away and the bones, properly labeled, were placed in

[1] McCollum, Simmonds, Shipley and Park, *J. Biol. Chem.*, 51 (1922), 41.
[2] Bills and McDonald, *Ibid.*, 68 (1926), 821.
[3] Steenbock and Black, *Ibid.*, 64 (1925), 263.

10 per cent formalin. In each litter a control rat was continued on the basal diet until the last pair receiving cod-liver oil and cod-liver oil extract was killed. This control served to show if any healing took place spontaneously. Later the bones were examined using the line test technique and the calcium deposited was judged as −, +, ++, +++, or ++++ by comparison with the plates referred to above.

TABLE III.

SUMMARY OF EXPERIMENTS COMPARING THE VITAMIN-D CONTENT OF COD-LIVER OIL AND COD-LIVER OIL EXTRACT.

Cod-liver oil per cent of diet.	Duration of test period, days.	Number of cases.	Average intake cod-liver oil per day per 100 g. of rat, Gm.	Line test.	Cod-liver oil extract per cent of diet.	Duration of test period days.	Number of cases.	Average intake cod-liver oil extract per day per 100 g. of rat, Gm.	Line test.
0.05	5	3	0.0051	0.0	0.05	5	3	0.0048	0.0
	7	6	0.0047	0.2		7	6	0.0042	0.0
	9	11	0.0041	0.9		9	12	0.0041	1.2
	11	10	0.0042	1.4		11	10	0.0042	1.3
	13	8	0.0048	2.8		13	8	0.0046	2.5
0.1	5	10	0.0090	0.7	0.1	5	9	0.0090	0.7
	7	9	0.0086	2.4		7	10	0.0083	2.0
	9	7	0.0082	2.9		9	7	0.0082	2.9
	11	4	0.0089	3.5		11	4	0.0089	3.3
	13	2	0.0097	4.0		13	2	0.0087	3.5
0.25	5	3	0.0217	1.7	0.25	5	3	0.0206	1.0
	7	5	0.0221	2.4		7	5	0.0226	2.4
	9	4	0.0204	3.8		9	4	0.0237	3.5
	11	4	0.0249	4.0		11	5	0.0257	4.0
0.5	5	7	0.0381	2.1	0.5	5	6	0.0351	1.8
	7	6	0.0381	2.8		7	7	0.0357	3.0
	9	2	0.0325	3.0		9	2	0.0285	3.0
	11	2	0.0330	4.0		11	2	0.0286	4.0
1.0	7	1	0.0577	4.0	1.0	7	1	0.0646	3.0
	9	2	0.0760	4.0		9	2	0.0584	4.0
	11	2	0.0623	4.0		11	2	0.0658	4.0

TABLE IV.

SUMMARY OF LINE TESTS WITH 108 RATS FED COD-LIVER OIL.

Duration of test period, days.	Cod-liver oil—Per cent of total diet. 0.05% line test.	0.1% line test.	0.25% line test.	0.5% line test.	1.0% line test.
5	0.0	0.7	1.7	2.1	
7	0.2	2.4	2.4	2.8	4.0
9	0.9	2.9	3.8	3.0	4.0
11	1.4	3.5	4.0	4.0	4.0
13	2.8	4.0			

SUMMARY OF LINE TESTS WITH 110 RATS FED COD-LIVER OIL EXTRACT.

Duration of test period, days.	Cod-liver oil extract—Per cent of total diet. 0.05% line test	0.1% line test.	0.25% line test.	0.5% line test.	1.0% line test.
5	0.0	0.7	1.0	1.8	
7	0.0	2.0	2.4	3.0	3.0
9	1.2	2.9	3.5	3.0	4.0
11	1.3	3.3	4.0	4.0	4.0
13	2.5	3.5			

With this method over two hundred and fifty rats were used and results obtained with 0.05 per cent, 0.1 per cent, 0.25 per cent, 0.5 per cent, 1.0 per cent and 2 per cent added cod-liver oil and 0.05 per cent, 0.1 per cent, 0.25 per cent, 0.5 per cent, 1.0 per cent, 2.0 per cent and 4.0 per cent added cod-liver oil extract over test periods of 5, 7, 9, 11 and 13 days. These data are shown in Table 3. The actual consumption of cod-liver oil and cod-liver oil extract for each rat has been computed as Gm. per day per 100 Gm. of rat. The results for the controls are not given here in detail as none of the fifty-one controls representing thirty-nine litters showed any evidence of calcium deposition. In making the summaries in Tables III and IV, the line tests were given numerical values of 0, 1, 2, 3 and 4 corresponding to $^{-}$, $^{+}$, $^{++}$, $^{+++}$, and $^{++++}$ respectively. This made it possible to average the values in each group and shows more clearly the relative amount of calcification induced by varying amounts of cod-liver oil and cod-liver oil extract.

SUMMARY OF STUDIES ON CALCIFYING PROPERTIES.

The average intake of cod-liver oil extract for any one group varied little from the average intake of cod-liver oil for the corresponding group, consequently in this comparison the varying intake of cod-liver oil and cod-liver oil extract is not a factor.

These results show that the extract Gm. for Gm. has no greater calcifying properties than a good grade of cod-liver oil.

The usual method employed where the line test technique is used is to feed the food being tested until a good positive line is obtained. The method used here is likely to be more sensitive in that it is possible to determine the amount of the substance which will give a positive line test of $^{++++}$ value within much closer limits since graded quantities are fed over test periods of a definite number of days not less than 5 nor more than 13. With a larger number of determinations and smaller differences in the increasing percentages of cod-liver oil and cod-liver oil extract added a more quantitative value should be obtained for the calcifying properties of these substances.

CONCLUSIONS.

The results given above show that the alcohol soluble extract used in these tests contained a negligible amount of vitamin A and had no greater calcifying properties Gm. for Gm. than cod-liver oil.

MISBRANDED COD-LIVER OIL PREPARATIONS.

An extensive survey was made during 1927 and it is being continued by the U. S. Department of Agriculture of cod-liver oil extracts of various products found in inter-state Commerce that do not conform with the statements made by the manufacturer.

VITAMIN D IN LIVER OF DOG FISH SALMON.

Scientists at the Prince Rupert Fisheries Experimental Station of the Biological Board of Canada have been gratified to receive from Professor Asmundson, professor of poultry husbandry at the University of British Columbia, confirmation of the local stations preliminary experiments relative to the content of Vitamin D in dog fish liver oil, according to information published in the Prince Rupert News of December 3rd and forwarded to the Department of Commerce by American Consul G. Woodward at Prince Rupert.

Professor Asmundson reports, as a result of preliminary experiments that he himself has carried out, that "dog fish liver oil is equivalent in medicinal value to the best cod-liver oil on the market."

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All articles in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. E. Cor. Lombard and Greene Sts., Baltimore, Md.

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A COLOR STANDARD FOR TINCTURE OF CUDBEAR, N. F.*

BY L. F. GABEL.

This paper was instigated by the fact that occasionally a sample of cudbear is found on the market which produces a tincture that varies in depth of color from the average lot of cudbear.

A standard color for cudbear would be desirable and with this in mind experimental work was conducted. Due to the intensity of color of Tincture of Cudbear it was necessary to use a weak dilution of the tincture so as to permit detection of a slight variation in color. The color of the dilution is a lavender shade with a reddish tinge. Efforts to duplicate this color were confined to the use of inorganic chemicals that would produce the desired shade of color. The use of inorganic chemicals for color standards was prompted by Dr. Arny's extensive work in this field. He has pointed out the advantage of the inorganic chemicals for this work, namely, the stability of the color of these chemicals in solution and the ability to make standardized solutions of the inorganic chemicals based on their molecular weights. Cobalt chloride produces a red solution in water. The addition of an excess of ammonium carbonate changes it to a purple shade resembling that of cudbear. This purple shade is deeper than the dilution of the tincture and does not possess the red tint of the dilution. It was necessary to add potassium dichromate to the ammoniacal solution of cobalt chloride to effect the red tinted lavender color of the dilution of Tincture of Cudbear.

Samples of six large lots of Tincture of Cudbear were obtained and dilutions of the tinctures prepared by adding 1 cc. of the tincture to 15 cc. of alcohol and diluting to 2000 cc. with distilled water. Ten-cc. portions of these dilutions were transferred to small test-tubes of uniform diameter and a comparison of the diluted tinctures revealed four lots of similar shade of color, one of lighter and one of darker shade. The average tincture was taken as a standard although it was realized that this would be an arbitrary standard since only six lots of cudbear were under observation.

After numerous attempts to duplicate the color produced by the average diluted tincture (1 to 2000) with the chemicals mentioned above, a formula was finally established which duplicated the color of the diluted tincture. The formula of the standard is as follows:

0.90 cc. *N*/10 Cobalt Chloride (1% HCl)
3.0 cc. Ammonium Carbonate, T. S.
0.70 cc. *N*/200 Potassium Dichromate
q. s. Distilled water to make 10 cc.

It is necessary to add the ammonium carbonate to the cobalt chloride before adding the dichromate.

The comparison of depth and shade of color was made by placing the test-tubes, one containing 10 cc. of the diluted tincture (1 to 2000) and the other 10 cc. of the Standard against a white background and noting the shade and depth of color in the test-tubes by looking down through the liquid.

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* Read before Section on Practical Pharmacy and Dispensing, A. PH. A., St. Louis meeting, 1927.

The dilutions of the tincture change to a lighter shade of color on standing, therefore it is necessary to compare the dilution with the standard the day it is made. The standard changes to a deeper shade of color on aging. This necessitates the preparation of the standard the day it is used. The tenth normal cobalt chloride and two hundredth potassium dichromate are stable, so these solutions can be kept for a long period.

We believe the formula given above can be used for a standard color for Tincture of Cudbear though it may be necessary to modify slightly the amounts of cobalt chloride or potassium dichromate to conform to the average of a large number of samples of cudbear.

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SPONGE.*

ITS HISTORY IN MEDICINE WITH A BRIEF ACCOUNT OF ITS HABITS AND STRUCTURE.

BY J. T. LLOYD, PH.D.

The rapidity with which iodine and its compounds have recently sprung into prominence in therapy is apt to lead one to believe that the remedy is of modern introduction. Study of the literature, however, reveals that in many of its present-day uses, iodine in combination is about as old as traditional medicine. True, the isolated chemical element was not known to the ancients, but preparations of sponge (its richest natural source) were known and dispensed in substance partly burned, or by extraction of the ash in solution. By either method a concentration of natural iodides and other salts in complex combinations was obtained.

Even before the beginning of the Christian era, when the civilization of Greece was at its zenith, sponges occupied a recognized place in medicine. More remarkable still, considering the lack of lenses for observing minute structures, they were even then classed in the animal kingdom. At least, about 320 B.C., Aristotle, "founder of zoölogy," and probably the first Greek to state that the earth must be a sphere, placed them among the animalcula.

In medicine the Greeks used sponge, both fresh and burned. According to Dioscorides,[1] Greek physician and author of a treatise on materia medica—

> "Fresh sponges, and those most free from oils, are helpful for wounds, and to check tumors. With water or vinegar, they bind up (literally, glue together) fresh wounds, while cooked with honey, they join together old wounds. Old sponges are useless. But even these are of value in softening up callouses and separating ulcers that are growing together, if bound upon them, dry, with a linen cloth. Fresh sponges placed upon old ulcers full of corruption dry them up. They also check the flow of blood.
>
> "Burned with vinegar, they are useful in inflammation of the eye; also where there is need of a detergent or astringent. But it is better to tincture the ashes with the remedies to be used for the eye. The ashes of sponges burned with pitch check the flowing of blood."—*Dioscorides, V:* 138.

If, as seems quite possible, the term translated "tumor," referred to the disease known to us as goiter, one present-day use of Spongia and its derivative,

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* Section Historical Pharmacy, St. Louis meeting, 1927.

[1] Translated and condensed by Miss Margaret Stewart, A.M.

iodine, is traced back to the first or second century after Christ. It is also interesting to note that even so far back, the tincture of burnt sponge was employed.

At the time Disocorides lived in Greece, sponge seems to have been well established in Syriac medicine. The Syrian physicians used it much as did the Greeks and also employed it in diseases of the respiratory system. For this purpose, "The Syriac Book of Medicines," 200 or 300 A.D., directs—"burn a sponge in the fire and crush it in wine mixed with water and administer as a draught." Interesting comparisons may be made with the works of many modern authors, such as Felter, who more than fifteen hundred years later (1922) wrote of *Spongia usta* (tinctured burnt sponge), "Spongia is much employed as a remedy for laryngeal irritation, and it seems to have been remarkably effective in croup and croupal types of cough." Thus it may be seen that since the time of Dioscorides, although countless medical preparations have flourished and become forgotten, for some reason Spongia continues to hold its place in medicine.

Through the Middle Ages and well into the nineteenth century, *Spongia usta* occupied a place of prominence among the most important remedial agents of Europe. Sometimes the burned sponge was macerated in wine or vinegar, sometimes it was dispensed as a powder. The following quotation from Lewis' Materia Medica described the method of burning sponges and also gives the most common uses of the preparation:

"Burnt in a close, earthen vessel, till it becomes black and friable, it has been given in doses of a scruple against scrophulous complaints and cutaneous defecations; in which it has sometimes been of service, in virtue, probably, of its saline matter, the proportion of which, after the great reduction which the other matter of the sponge has suffered in the burning, is very large. By virtue of this saline matter also, the preparation, if ground in a brass mortar, corrodes so much of the metal, as to contract a disagreeable taint, and sometimes an emetic quality:[1] hence the college expressly orders it to be powdered in a mortar of glass or marble."—*Lewis' Materia Medica, London*, 1768.

The belief that spongia owed its medicinal virtues to ordinary "saline matter," ended in the failure of an attempt to substitute a mixture of alkali and charcoal. That this attempt to displace Spongia was a failure and so accepted before iodine or its compounds were known is evidenced by the following quotation from the Royal College of Physicians, London, 1809.

"Burnt sponge appears practically to produce effects which no mixture of the alkali and charcoal does, especially in the removal of bronchocele; and it is therefore retained."

In 1812, Courtois, of Paris, while manufacturing soda discovered iodine in the mother liquors of kelp. This was followed by its detection in other marine plants as well as animals and led many physicians and pharmacists to conclude that to iodine alone the virtues of Spongia should be attributed.

The "Pharmacopœia," of which two editions were published in Boston, 1808 and 1828, "by authority of the Medical Societies and Colleges," recognized Spongia. The first edition of the United States Pharmacopœia, published in Boston in 1820, gave it a place. It was also made official in the second edition of the United States Pharmacopœia, published in Philadelphia in 1830, as well as in the single New

[1] The emetic quality mentioned by this and other authors may have been due to a compound of copper produced by contact of iodine with the brass mortar.

York edition of the same date. In 1830 iodine and its compounds received their first official recognition, being mentioned in both the Philadelphia and New York issues. Following editions gave place to iodine but failed to mention Spongia which soon became almost obsolete in the practice of many physicians. At the present time, however, there is an increasing demand for the pharmaceutical preparation Spongia.

Pharmaceutical Constituents of Spongia.—John Uri Lloyd comments on the constituents of Spongia as follows:

"Sponge contains a large amount of combined iodine, also bromine, phosphorus, sulphur, silica and other elements in unknown combinations. Whoever reasons concerning the action of compounds made up of such substances as unknown combinations of the elements that theoretically may be formulated into sodium chloride, calcium sulphate, sodium iodide, magnesium and iron oxides, unknown sulphides, and phosphates reorganized from organic tissue and reconstructed by heat into complex organic bodies, presumes much in asserting that such combinations depend solely for their qualities upon a single substance that may by destructive chemical processes be isolated from the original product. The intermolecular constitution of burnt sponge is to-day unknown. The uses of this preparation by physicians who employ it in contradistinction to iodine or its definite artificial compounds, are accepted as logically applying to a structural something that must be very different from pure iodine or a single iodine compound."

That such inorganics as are present in spongia (burnt sponge) though often considered practically inert, may under certain conditions exert a profound influence is well illustrated in the following quotation from Dr. S. P. Kramer,[1] Ex-President of the Cincinnati Academy of Medicine.

"The reaction between lime and silica is very interesting and important. If one add a small quantity of lime water containing 1.4 per thousand of Calcium Hydroxide to a solution of colloidal silicic acid (containing 0.7 per cent) a jelly is immediately formed. This is probably an adsorption compound and not a true chemical compound. The amount of lime adsorbed varies very greatly and if one keeps on pouring water over such a jelly, an increasing amount of lime is taken up.

"This calcium silicate or adsorption compound is exceedingly toxic. Thus an amount of this jelly solution containing 5 mg. (.077 grains) of calcium silicate when injected into the jugular vein will immediately kill a rabbit weighing 1500 grams (23,148 grains). When this jelly is examined under the ultra-microscope, it is seen to be made up of amorphous clumps much larger than the minute particles that are found in the colloidal solution of silicic acid.

"If to a solution of sodium silicate there be added lime water, instead of colloidal jelly there is formed a definite aggregate or precipitate of calcium silicate. This form is not at all toxic. One may inject 100 mg. (1.5 grains) of this form of calcium silicate into the jugular vein of an animal without producing any effect whatsoever."

On the Habits of Sponges.—Sponges occur in all oceans, in fresh water lakes, ponds and rivers of all continents. In the ocean they are found from tidewater to the greatest known depths. The deep water Hexactinellida whose delicate siliceous skeletons are objects of such marvelous beauty, do not reach their maximum numbers until a depth of more than one thousand fathoms (more than a mile) is passed.

Reproduction among sponges is accomplished by three distinct methods. The simplest of these, "budding," takes place in nature when a portion becomes broken from the sponge colony and starts life as a separate individual, much as a

[1] Read and demonstrated with specimens, before the Cincinnati Research Society, February 1, 1927.

branch broken from a willow tree may take root and grow into a separate tree. This form of reproduction by fragments of the colony is now being used to serve the commercial interests of the sponge fisheries. For this purpose living sponges of the most desired kinds are cut into fragments, which are planted on the sponge beds where they grow into mature sponges. This is the only manner by which the depleted sponge beds can be replenished by man. By this method seven years are required to develop a sponge of commercial size.

Sexual reproduction is the most usual mode of natural propagation. The young sponge, or larva, developed by the union of the two sex elements, is a minute creature which swims free in the ocean, feebly propelled by minute vibrating hair-like processes, termed cilia. The larva resembles the parents so little that no flight of the imagination could conceive of their relationship. After a period of free life, the larval sponge, if fortunate enough to settle on some solid support becomes fastened and completely alters into the well-known adult form; after once becoming sessile, it is never again capable of moving from place to place. Probably the larva's own power of locomotion could carry it but a short distance from its place of birth. However, when one considers that some ocean streams move almost a hundred miles in a day, the wide distribution of sponges can be readily comprehended.

The third form of reproduction is found among the fresh water sponges, and perhaps a few marine species. It is termed "gemmulation," and is a provision Nature makes in many of the lower plants and animals that live in environments which undergo radical changes, such as drying or freezing. The gemmules are egg-like bodies which ordinarily form in the body of the parent when its environment starts to change. Unlike true eggs, the gemmules are multi-celled and development does not require the union of sexual elements. Each gemmule is surrounded by a hard shell and can withstand freezing temperatures or long periods of desiccation in hot sunshine. It is largely through the agency of gemmules or "winter eggs" that the repopulation of temporary pools formed by the freshets of springtime takes place.

For the most part sponges show but little preference for the nature of the support on which they spend their lives. Any enduring hard object, washed by fresh clear currents will do. There are, however, a few species which have become dependent upon other organisms for their existence. Conspicuous among these are the small sponges that tunnel in the shells of oysters and other mollusca, and one species that is found nowhere except on the backs and legs of certain crabs. The first of these finds protection in the oyster shell, doing little or no harm to its host, while the other in return for transportation offers an effectual, portable hiding place to the crab.

Sponges are now quite generally regarded as animals, although until a generation or so ago most people, with the possible exception of the ancient Greeks, thought they were marine plants. Some scientists of the past generation though unwilling to separate them from the vegetable kingdom, preceived that they had many of the characters of animals. To these men they were known as zoöphytes or animal-plants.

Before the microscope made observation of minute protoplasmic structure possible, it is remarkable that even the most critical observers should have even

suspected the animal nature of these collapsible masses of felt-like fiber. Motion, the popular distinguishing character for separating plants from animals, is entirely lacking or limited to the power of contraction possessed by certain species. Even this contractile power is less than the movement of some sensitive plants. Lacking as they do, all perceptible organs, it is, as remarked by Dr. Sollars, "by negative characters that sponges may most easily be recognized."

In form there is wide variation among the different species. While some maintain a fair degree of adherence to a general type, others are profoundly influenced by the contour of environment. Some species spread over or around their supports while others grow upward in stemmed cups or branched bunches of finger-like stalks. Some, like the bath sponge, approximate spheres, while others assume forms of the greatest variety.

The supporting skeleton of sponges is composed of calcium or silica or, like the bath sponge, an elastic felt-like network of spongin, an organic material akin to silk. Some have siliceous spicules cemented with spongin, while in a few the skeleton is entirely absent. The calcium and silica of sponges is formed into spicules, often having beautiful and complicated forms.

For present purposes a sponge may be likened to a thick-walled vase, with its entire surface perforated by small holes leading into its interior cavity. Of course, only a few sponges are this simple. More complex canal systems are the rule, but these are formed by the union of many of the vase-like systems. In life, the never ceasing lashing of minute, delicate, protoplasmic threads, termed flagellæ, scattered over the lining of the channels, keeps up a constant flow of water. The current always enters the many small, incurrent canals and leaves by the large excurrent channel, corresponding to the mouth of the vase. In passing it bathes the epithelial lining of the sponge with an ever fresh respiratory current. It carries in food material in the form of minute, organic particles and also eliminates waste. It supplies the inorganics which the protoplasm extracts with a nicety that is unparalleled by the most delicate methods that man has invented. According to Professor Sollars:

> "The quantity of silica present in solution in sea water is exceedingly small, amounting to about one and one-half parts in one hundred thousand. Hence, it would appear that for the formation of one ounce of spicule, at least one ton of sea water must come in contact with the body of the sponge. Obviously from such a weak solution the deposit of silica will not occur from ordinary physical agencies, it requires the unexplained action of living organisms."

It is probable that the accumulation of shells thus formed is responsible for the deposits of certain siliceous rocks. While many different marine animals have left their remains in these deposits, sponges, according to Professor Geikie, "appear to have mainly contributed to the formation of the important accumulations of flint and chert." Speaking on the same subject, Professor Sollars says:

> "This may account for the fact that deposits of flint and chert are always associated with organic remains, such as Sponges and Radiolaria. By some process, the details of which are not yet understood, the silica of the skeleton passes into solution. In calcareous deposits, a replacement of the carbonate of lime by the silica takes place so that in case of chalk the shells of Foraminifera are converted into a siliceous chalk. Thus a siliceous chalk is the first stage in the formation of flint."

In medicine, calcareous and siliceous sponges have never found a place. Only the felt-like sponges, such as the familiar bath sponge, have been employed. These have skeletons of spongin, which is remarkable for its large content of iodine. In some tropical species, according to published reports, the iodine content may run as high as 8 to 14 per cent, while seaweed from which commercial iodine is obtained, does not exceed 1.5 per cent. If, as is estimated by Stanford in Thorpe's Dictionary, the water of the Atlantic Ocean contains only one part of iodine in 280,000,000 parts, each pound of those sponges contains the total iodine content of almost forty million pounds of water. That this enormous amount of water could be circulated by the delicate flagellæ seems beyond the limits of reason. It has been suggested by John Uri Lloyd that the abstraction of iodine from the water may form an "iodine vacuum," so to speak, which is filled by the inrush of iodine extending from afar in the surrounding water. Thus the iodine may be depleted from water far from that which touches the sponge. Another theoretical explanation is the possible, increased iodine content of water in localities where sponges grow by the disintegration of the remains of kelp, sponges and other marine plants and animals. Or, it may be that sponges do not themselves abstract iodine from the water, but obtain it from the organisms they consume as food. Perhaps plants alone possess the power of abstracting iodine from the sea. Whatever the explanation, it seems beyond comprehension to understand the power of these animals to abstract such quantities of iodine or silica from the dilute sea-water solution.

SOME OF THE EVILS OF THE DRUG BUSINESS AND THEIR REMEDIES.*

BY JOSEPH JACOBS, PH.M., SC.D.

The business side of a pharmacist's life and career must ever be a subject of interest to our profession. Success or failure marks the difference between a condition attended by the contentment of recompensed labor and one that is "bound in shallows and in miseries."

If the measure of our service to society is the true criterion of the financial success deserved, may we not say that the "wavering balance" is not "rightly adjusted?" If so, what are the causes? What may be the remedies?

My observation is that no other business requiring such special preparation, difficult study and hard work is more meagerly repaid than that of Pharmacy. The commercial agencies accredit less than half of the retail pharmacists with a rating over $5000.00, and should you tour our cities and towns you would observe few fine homes in the best residential districts owned by druggists. Your guide could easily point out many owned by lawyers, physicians, department-store owners, grocers, hardware merchants, bankers and contractors. Nor do many of their names appear on financial boards of directors.

The reasons for this condition are numerous. They grow out of adverse influences operating from the outside and from faults and errors existing within.

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* Read before Section on Commercial Interests, A. PH. A., St. Louis meeting, 1927.

The prohibition laws being violated by the existence and operation of so many disreputable pseudo pharmacies, in many of our States of the Union, has reflected discredit on the legitimate stores, and thus diminished prestige and profits. Classed with these may also be named the "Soda Stand pharmacists," who cause injury. The wide spread evils of the "boot-leg" drug store are too well known to need comment here, but many would be surprised to know the number of "Soda Stand" drug purveyors. A reliable agent of mine reported to me that in the first three out of many he investigated he found a full stock of the most staple patent medicines and toilet articles.

On a personal visit to one of these "Stands," the owner was asked if he filled prescriptions. After asking me what was my trouble, he pointed to shelves loaded with many articles in the drug line, and said: "We have our prescriptions already filled." Signs over doors and on windows read: "Toilet Articles, Drugs, Soda, Cigars and Candy."

On the motions of their Boards of Pharmacy, Illinois, California and Michigan have enacted that no such stands, nor a general store within three miles of a drug store, can sell any medical preparation in a large list. Our Georgia Legislature has before it now a similar bill.

Nearly all the large and increasing number of Beauty Parlors carry a line of toilet articles, presumably made by makers of barbers' supplies. They also sell many staple brands. The local druggists should see to it that they pay proper licenses. And, if druggists intend to retain trade in men's toilet articles, they will have to do battle with the chain cigar stores, who prominently place them on their show cases and in their windows and insistently call attention of the customers thereto. We must meet this competition by better displays and more effectively pushing their sale to those who are more accustomed to buying such goods from drug stores.

Increasing numbers of peddlers are now invading our domain. It may be well for us to display in our windows warnings against these "fly by nights" as has been done by the Ohio Association under their Secretary, T. J. Wetterstroem, who sent out a framed sign effectually showing it would be well for the public to "Beware of the Peddler."

The Department Stores also are giving the druggists something to "give us pause" and awaken opposition. The manager of one of them told me in answer to my query as to his "mark up," on "ready to wear" that it was double and often more, even when the goods were bought under "extra dating" and ten per cent discount for cash. No wonder he could advertise a full line of standard toilet articles to be sold at less than cost to customers who would also probably buy some of his gowns and other garments in "ready to wear." Of toilet articles, a lady friend told me she bought a large supply (they were so attractively arrayed), almost "ere she was aware."

In a large town I was visiting last year, a drastic price war was going on in toilet articles between two department stores, and I was told by a friend in the drug business that when other reputable department stores did not handle any toilet articles, or sold them at fair prices, their own families and their friends bought goods from such stores, giving them the preference. One of the largest department stores in New York City, Hearn and Company, has advertised for

many years a slogan that they "do not handle groceries or drugs" and hence they get the friendly support from those occupied in these trades.

Another detriment to the welfare of the retail drug trade comes from the many hospitals and sanatoriums, both public and private. The number of them is constantly increasing. With their supplies of tax-free alcohol and large number of medicinal preparations bought at especially low prices from the manufacturers, they have advantages over the retailers.

This might be borne with some complaisance by the public and the druggists, if the patients were receiving a real benefit by their practices. But, the contrary is true—the patients, in many instances, are charged from two to four times the regular price of prescriptions compounded by registered pharmacists. I was much surprised by a statement made to me by a steward of one of these hospitals. He said that patients were required to use two pints of alcohol in baths, per day, at the price of $2.00 a pint, which had cost $1.00 a gallon. Dakin's Solution was charged for at $1.00 a pint, when it had been made for 10c a pint; silver nucleinate was dispensed at the rate of $10.00 a pint. The steward said that in this institution about fifty other prescriptions were daily compounded for the patients and these rendered in the bills at similar exorbitant figures.

If this evil is not corrected, the public might be justified in placing these institutions under a board similar to our Public Utilities Board or empower State Boards of Health to regulate the charges. The Government ought to, at least, require a tax on their alcohol, except in cases of purely charitable hospitals.

As to taxes in general, the cities, States and general Government ought to lessen the taxes both in kinds and amounts now required of pharmacists. About thirty different kinds of tax exactions tax also, our patience, our time and our profits to much too great an extent. The remedy is for our ASSOCIATION to imitate the physicians and have some member of our ASSOCIATION in Congress to keep alert to remedy the evil there, when necessary; and we should put in motion efforts in our State Legislatures and City Councils to correct them locally. Georgia is fortunate in having six members of our profession in the present General Assembly, now in session, and they are active in this connection.

The relations between the physicians and the pharmacists should be friendly and cordial. Their work is for the same purpose—the conservation of health and the prevention and alleviation of human suffering. They ought to, and could be, mutually, financially helpful to one another. But fairness will arrest the steps of the physicians when they attempt to go so far as to cut from our lists everything unless specially labeled under their direction. Unless halt is called in this, it may soon be unlawful for a customer to buy Oil of Clove for his gums or to apply Iodine to his soft corns without a prescription.

Let us hope that a war may not be started in which we might have to insist that their prescriptions shall contain a history of the diseases for which they are given, to prevent the medicine chests of patients from being filled with half-used concoctions liable to be taken by mistake. The boxes and bottles they inveigh against at least convey a definite statement of the ailments for which they are intended.

If pharmacists, however, "hang their heads and a' that," indulging an "inferiority complex," instead of deserving and inspiring and receiving equal

respect with the physicians, we may expect to be over-ridden in this and in many other matters.

While thus descanting on our woes, I mention the fact that many of our young men, who would make good executives and managers, insist on opening stores of their own on insufficient capital and flimsy bases of credit; and with little business acumen to guide them. The result is an overcrowded condition; and, while these men drag along on profits less than a good salary would yield, and which they are capable of earning without risks, really competent drug-store owners are brought into useless competition, and the bankrupt courts are furnished much unnecessary business.

Fifty-four thousand drug stores in the United States would seem to be too large a number. This tendency is due to the fact that too many young men, at this time, are insufficiently educated to know the full duties and requirements that go to make a pharmacist successful in his business.

Public Health, as well as the good of the drug business, demands that our colleges turn out graduates of a more advanced and finished type and with a higher degree of special commercial training than short courses can produce.

It would be especially beneficial if every graduate, besides other training along business lines, should know how to make and exploit one or more original or individual preparations suitable to his clientele, and be highly trained in merchandizing in addition to his technical and scientific courses.

When they establish their own stores they would know that it is better to make one original preparation that did not simulate some advertised article, and make it by the exercise of brains and ingenuity, than to attempt many, not unique or original. Imitations do not appeal to the public. So, also, he should know it is not good practice to push a line of goods marked in his name, but made by some other manufacturer. He should know, by making them himself, that he places his "guinea stamp" only on the true "gowd" of genuine ingredients, tested and unadulterated.

A Word about Buying Goods.—Caution should be exercised in buying merchandise offered by unknown salesmen or whispering venders. About twenty years ago in Atlanta, Georgia, nearly every drug store in the city was overstocked with a number of well-known advertised proprietaries. The store that was free from these imitated articles was the one that the other druggists felt a grievance against, but this store did exercise caution in buying its merchandise either direct from manufacturers or from responsible dealers.

Another contributing cause of drug-store inefficiency and failure—a very conspicuous one—is faulty and inconvenient arrangement of fixtures, furniture and the display of facilities of the store. This is bound to be accompanied by disorder, dirtiness and bad surroundings in the prescription department. The clean and orderly store invites and arouses the owner to be more alert in stimulating business and clerks to work with more comfort and efficient energy. Such will be the effect, also, of having clean, fresh goods, preferably nationally advertised articles, in tastefully arranged groups and series on display counters and tables and in show windows.

I will only say relative to the much discussed subject of "cut prices" that there are times when it is well to reduce the sale price in the face of competition or when

space is needed for the quick turnover of some line of goods in large and urgent demand. And, on the subject of standard prices as a regular course of trade, it can be expected that chain drug stores will not oppose any fair law, should its passage be secured without the process of heaping abuse on their heads. That will naturally be opposed and resented.

For every one of the evils I have cataloged hoping to find a remedy, there could be named, on the bright side of the picture, a feature of Pharmacy to make us happy and bring content. All who have its true interests at heart and have spent their lives worthily in the profession know that its lofty character makes it bring to its devotee the common pleasures of life, if worthily pursued with good judgment, energy and high intentions. And it can be made the foundation for competence and even wealth.

A COLLEGE COURSE IN DRUG STORE DISPLAY.*

BY EDWARD H. NILES.

This will relate an experience, rather than set forth a course for others to follow.

When we received word that the National Research Bureau intended to determine the sales value of windows, we began to wonder just how our graduates could coöperate. We began a study in stores, and soon learned that few owners or managers had any technical knowledge of window dressing, but at least ninety per cent considered it a useful knowledge. A very frequent query was, "Why don't you teach something practical about display at the college?" We were fortunate in having available a room about twenty feet by thirty-five feet; a corner room well lighted and located. We decided to devote this to display work.

Our first step was to provide two store windows. We could find little information as to size in literature, but calling to our aid some practical decorators, we learned that a window should be at least six feet high to give head room. The width is best when it will conveniently allow the back to be trimmed with standard crepe paper which is twenty inches wide; a little allowance should be made for lapping the edges. The back should accommodate an odd number of strips for symmetry of design. Evidently the proper widths for an ideal window would be 57, 95, 133, 171 inches, etc. We selected eight feet (96 inches) as our width and six feet six inches as our heighth; this latter figure allowed room for ceiling lights.

Having completed our windows, we wrote to a selected list of prominent manufacturers for displays, which of course were cordially presented. Our working equipment naturally included hammers, tacks, scissors and a good variety of crepe paper and some cloth.

Fortunately, we were able to obtain a qualified instructor, a man who had attended several Display Schools, and who had devoted two years entirely to drug store merchandise.

The most interesting thing was the reaction of the students. The course was offered without cost to the seniors as an elective for one semester and without credit hours. Every class member enrolled.

From the beginning the course included lectures and actual work with decorating materials. The manipulation of crepe paper in tubes, pleats, strands and

* Read before Section on Commercial Interests, A. PH. A., St. Louis meeting, 1927.

designs was mastered in two periods, and then actual work in the windows began. At first the instructor trimmed a window in view of the class which copied the design. The work was then torn out, and during the next two days each student was required to replace the decorations. A little later the students submitted original designs to the instructor and, if approved, a time was arranged when they were to be placed in the windows.

During the course each student trimmed about twenty windows; all had the same types such as tobacco, candy, rubber goods, shaving needs, stationery, etc; yet of the hundreds of windows put in, no two had the same background nor the same arrangement.

After a few weeks, students were given an opportunity to trim windows for merchants in various parts of the city. Such work was strictly graded by the instructor. The week before Mother's Day, the students trimmed windows for twenty-two stores, with satisfaction in every case. Finally, all entered into a contest wherein prizes were awarded for the two best windows.

We summarize our results as follows: The students eagerly accepted the course, and there were no withdrawals. So much interest was shown that boys were willing to work nights or Saturday afternoons to put in their displays, though they got no college credit for their time; they sincerely believed that such knowledge would be very valuable to them as clerks and owners in the work of a retail drug store.

The course will be repeated during the coming college year.

INDIANAPOLIS COLLEGE OF PHARMACY.

TURN TIME AND TALENT INTO TREASURE.*

BY JOSIAH C. PEACOCK.

After all the definitions of the practice of pharmacy are exhaustively examined it is found to be the proper delivery of an essential service.

But pharmacy, like every other service that would survive, must perpetuate itself through practice as the appreciable way by which to demonstrate its essentiality. In other words, but far from facetiously, the pharmacist must make himself indispensable as such. His immediate prosperity as well as the future security of his investment depends upon the spirit and the service which are put into the conduct of his business, for these must always be accepted as the expression of the store's concern and capability in the practice of pharmacy.

He has made a good start by adopting slogans with which to attract the notice of the public to the drug store, and by setting apart one week of the fifty-two in which to emphasize the importance of the practice of pharmacy—his special training and service.

But while the sign placed on the window brings people into the store, the pharmacist still has something to do if he is to make full use of his prerogative and possibilities to "turn time and talent into treasure," since getting attention is but the first step toward success, and all the balance of the way the delivery of a self-securing service through the sale of satisfaction.

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* Presented before Commercial Section of AMERICAN PHARMACEUTICAL ASSOCIATION at St. Louis meeting, August 22 to 27, 1927.

And now with concern so definitely centered about the advantage of giving this attention to the practice of pharmacy, might not the pharmacist advantageously adopt a slogan, such as the title, for animating, actuating and activating himself; some motivating motto which he can repeat to himself over and over until it becomes his 365-day plan of procedure.

But this suggestion to "turn time and talent into treasure" is more than a mere admonition; it is even more than a proposition to attain success through the practice of pharmacy; it is the expression of the formula for doing that very thing. It is also offered as the specific prescription—the panacea, for the growing pains of pharmacy (the cause of the pharmacist's uneasiness) and for saving and securing pharmacy to the pharmacist.

It is both plea and plan for purpose more than the simple swapping of meaningless merchandise for momentary money. It asks for the practice of the pharmacist's prerogative, for the selling of the pharmacist's special training at a profit, the serving of the practice of pharmacy to the public for sufficient wages, for such satisfactory compensation, that there shall be constant incentive to the pharmacist to keep his attention, his eyes and energies, on this avenue to success.

The application of this formula calls for the factors of fitness, faith and functioning in pharmacy, if treasure is to be had out of pharmaceutical practice.

It is asserted that the pharmacist having fitness who faithfully devotes his time and talent to the pursuit of pharmacy cannot escape success.

The claimed result is treasure, three-fold treasure; the monetary profit that is so conspicuously sought; merited prestige which is ready and profitable publicity and mercantile protection. He has a special privilege by grant of license; an opportunity through which to prove his indispensability and secure his investment.

Therefore, the pharmacist has all of the merchandizing rights of any other storekeeper and his additional license as a pharmacist for good measure. With this extra advantage, this special grant through which to demonstrate the value of his service, the pharmacist should be willing to take chances with, to try conclusions with, to compete with any other kind of storekeeper.

Now while it is said that the attainment of success is much an attitude of mind, this posture is properly presumed to be a persistent pushing toward the goal, not simply standing like statuary in covetous contemplation of it.

The pharmacist who is graduated to-day is trained to know and to do the things which constitute the theory and practice of pharmacy. While the world needs much new knowledge, it needs new knowledge less than it needs the actual application of the knowledge it already has; for it is the utilization of knowledge, the turning of it to advantage, not just the possession of it that proves its power. And assuredly, so far as the practice of pharmacy is concerned, that word "power" as it applies to knowledge calls for use, operation, application.

Indeed we will always do well to remember that pharmacy and the pharmacist are the counterparts of art and the artist; that neither fortune nor fame is to be attained through purposeless possession of the know-how, but only through the actual application of the knack; that mere musing will neither paint a picture nor pocket a profit.

Now what does all of this mean and point to but to the recognition of the

settled advisability to employ, to move, to exchange, the training of the pharmacist to some profitable effect; to sell the services of the pharmacist as well as his wares; to merchandize pharmacy itself. So we see there is another way of saying this thing; it is—that the pharmacist merchandise pharmacy as his surest way to profit, prestige and protection.

And, thus, we immediately note that turning time and talent into treasure implies the merchandizing of pharmacy or *vice versa;* while the reciprocal factors, values, effects and forms which this proposition involves become more and more impressive because imperative, as we try the formula on the many problems which come before the pharmacist for solution.

Turning time and talent into treasure calls for the hunting out of things which the pharmacist's training and license gives him special preparation and privilege to accomplish for profit. It is the policy and practice of knowing things, having things and doing things.

It soon stamps the pharmacist as headquarters of initiative, resourcefulness, energy and dependability in all matters pharmaceutical.

To sell his specific service in the substance of significant satisfaction is to prove his value to the public and secure his investment to himself; that's his mercantile protection.

So again we say that what the pharmacist needs to do for both his present prosperity and the security of his investment is to merchandize pharmacy, the service in which he is trained, to turn time and talent into treasure.

In considering such course, it will be found that there is no end to what may be said in favor of turning time and talent into treasure by merchandizing pharmacy; while there is nothing that can be said against either the propriety or the advantage of doing this. There is nothing more pressing to be said in its favor, nor anything that should be more persuasive, than that it is the pharmacist's obligation to himself to do this for himself, and for no one else. He needs no altruistic motive. Indeed, the everlasting practicality of both the proposition and the formula for the proving of the real value of his service resides in the fact that, though he uses these entirely in self-defense or for purely selfish reasons, the result is improvement of service to both public and pharmacy as well as benefit to himself.

When the pharmacist thinks that pharmacy has the stomachache it is almost invariably because he, himself, is the uneasy one; due to his having fed his business the wrong kind of food for its sustenance and growth; or because he has disturbed the digestion of his pharmaceutical training by competing with himself, more than with anybody else, in non-pharmaceutical commodities and concerns. In the essence, he has diminished his dependence and determination to turn time and talent into treasure, by dividing, by diverting, by diffusing his direction. It is he that must take the cure, by concentrating better on pharmacy.

The pharmacist who is using his time in pursuit of his pharmaceutical training, who is turning his time and talent into treasure through the bestowal of this attention on the possibilities of his business, is not worrying about the stock and methods of the grocer and the cigar store; whether they have drugs for sale or what may be their prices. And the fact that concern about price has conclusively been shown to be the last feature of consideration in the public's appraisal

of service makes a golden opportunity both to give a proper service and to secure a price sufficient to assure satisfaction to dealer and customer alike.

Turning time and talent into treasure enhances pharmacy in the public's esteem; but mere trading on the fair name of pharmacy destroys respect for an essential service. And, as all will agree, only legal trafficking in any business will admit of self-respect.

Earnest engagement in such merchandizing of pharmacy better than all else will reveal one's attitude toward his special training and determine his right of claim as a pharmacist.

And it is plain to be seen that if half of the pharmacists of to-day will merchandize pharmacy as interestedly and intensively as the other half is willing to diligently divert attention from it, turning time and talent into treasure will answer the question of how many pharmacists there shall be and how the number of pharmacies shall be limited. Indeed, this proposition to turn time and talent into treasure is the way, the only economic way, whereby pharmacy can be saved and secured to those pharmacists who are ready to prove their worthiness of the trust; and as this result is in the interest of the pharmacist, naturally it must be brought about by him through the proper delivery of this essential service.

And let no one betray himself by opining that the public's interest, any more than sense of fairness, will long deny the privilege of practice to any who deserve it; be they corporate chain or individual link.

Now a prescription that claims to be specific should have a foundation of common sense securely beneath it; and when a panacea for economic ills is offered, it is not only logical but proper to challenge the claim from every angle of review as the means of discovering any actual value that it may have, of finding its enduring worth.

Accordingly, pharmacists are asked to check up on the potentialities with which this formula has been fraught by all human experience; to ponder it; to play it on pet problem, proverb and prophesy.

In comparing this formula with any present policy or pursuit its terms may be read in the plural as well as in the singular, for then each of these acquires added significance: time may be read as times, and talent as talents; treasure has already been shown to be three-fold.

Each pharmacist may tell himself whether he is looking for opportunity in pharmacy to turn time and talent into treasure, or whether he is directing his attention outside of pharmacy, whether his business is developing with the times; whether his talent and talents are invested in pharmacy, and whether the onward march of things is giving him a less or a more encouraging perspective of his future fortunes in pharmacy—for pharmacy is marching on!

When, not so long ago, this word "merchandizing" came into the vocabulary of the pharmacist, many earnest friends of pharmacy became alarmed lest pharmacy should be neglected. Their apprehension came chiefly of the mistaken assumption that merchandizing was only the supplying of questionable goods at a doubtful price; when in reality it is the making of opportunity to sell service, the very thing in which the pharmacist stands in constant need as the ideal occasion wherein to demonstrate his indispensability.

"Merchandizing," even then, was a friendly warning to turn from the vague and vacillating abstract of absorbing anxiety, which might lead to chance success in the practice of pharmacy, onto the specific and steady concrete of purpose, policy and pursuit that runs bee-line to sure success. "Merchandizing" was a sign of the trend of the times that said "this way to prosperity in pharmacy," "that way to elimination from pharmacy."

But our over-cautious friends took it to be the skull and cross-bones of danger and destruction; and they set up a bugaboo by claiming that merchandizing is contrary to ethics. Commercialism was decried as a loathsome disease which pharmacy might contract, instead of being recognized as the salutary shaking which pharmacy needed to awaken it from its lethargy of mood and mode that it should not be aggresive in seeking attention for its significant service.

Now what if merchandizing does imply intensive effort to bring about exchange of goods or service for money? There can't be anything inherent in that alone which is contrary to ethics. Besides, that very thing as an indisputable indication of individual industry is a world-widely well-known and welcome way to three square meals a day. And since every occupation, and that embraces the professions, demands primarily enough of the hard-headed sense of commercialism to at least grubstake itself, we scarcely need to mournfully meditate nor languishingly lachrymate, certainly we should not erroneously "ethicate" about there being too much commercialism put into pharmacy (unless we find it in the other fellow's place of business)! Instead, the fairest of mind and the faintest of heart among us may well crowd into the store such qualities and quantities of commercialism that we shall force out the treasure we desire and deserve from the pharmaceutical service rendered. Commercialism that thus turns time and talent into treasure is certainly completely compatible with conscience and consequently with ethics.

Merchandizing is a function applicable to all business and businesses, young or old, big or little, any time, any where, by anybody. It is just another name for the old game of pursuing one's business with attention and determination; that is turning time and talent into treasure; which is to say that a storekeeper knows what business he wants to engage in, what he wants to feature and sell, that he has the goods with which to do this, how he wants to do it, what the doing calls for and what will be the result.

He has something definite in his mind to do, to turn time and talent into treasure; he knows that unceasing attention is demanded to carry out his plan and enable him to take the profit he has in view as the result of his effort; and he provides the necessary attention and attendance through himself or others.

Merchandizing also implies full knowledge of what one has to sell; the relation of supply and demand, the market; how to buy as well as how to sell; cost price and selling price of service as well as of substance; and many other considerations which mean that the merchant or merchandizer is keenly alive to his objects and opportunities.

There is a fascination of double reality in the word "merchandizing," for it implies both matter and motion. The word is surcharged with order, resplendent with enthusiasm and vibrant with determined effort. No other word has compressed into it more of that essential vigilance demanded by all the things with which pharmacy is concerned; and it surely has the ring of reward to it.

Within more recent years, "merchandizing" has taken on the significance of intense attention and activity, symbolizing modern store-keeping as transacted by trained and trusted heads, hearts and hands.

And since successful merchandizing calls for specific knowledge, focused purpose, understood method, keen insight, constant circumspection, everlasting enthusiasm and persistent effort, as well as good goods, could pharmacy ask for a better opening through which to prove its worth than through turning time and talent into treasure?

The commercial courses in schools of pharmacy like the sections on commercial interests in associations may well be aimed at showing the pharmacist how to merchandize the practice of pharmacy; otherwise his attention, aim and application, if not his ambition, are divided, misdirected, and the intended major object of his commercial training is defeated.

Turning time and talent into treasure is the primary principle of common sense use of special training; or, scientifically and financially, the economic exercise of this investment.

Merchandizing tells us to display and advertise, not only in window and in print but in the very service which we give, by putting into it a recognizable quality of competence and completeness that begets an unforgetable satisfaction which brings them back and sends their friends.

Whether intended or not, every business has a policy under which it operates—whether conscious of this fact or not.

This proposition to turn time and talent into treasure will satisfactorily answer every question in the list of topics for papers before National, State and local associations in which pharmacists ask the way to protection and prosperity. It is the answer to any fault that anyone can find with pharmacy.

Invariably this formula prepares the way to slide a dollar off of the expense side onto the side of profit. It will speed up the turnover and double the profit without increasing those fixed charges generally called overhead. It will make a credit of every clerk, for by it each of them will make a credit of himself.

For the proprietor, turning time and talent into treasure is post-graduate work; for the clerk, it will be an inspiration through which he will be glad to learn and earn his right and rank of proprietorship.

Through the attention that turning time and talent into treasure enlists the problems of simplified yet sufficient stock, of stock-keeping and of reordering are brought to almost automatic functioning.

Turning time and talent into treasure reveals the wonderful prevalence of opportunities and examines them for potentialities in profit, prestige and protection. It finds and makes unheard-of opportunities, interprets opportunities, enlarges opportunities, improves opportunities, in every instance embracing opportunity.

Turning time and talent into treasure makes the calendar an ever-recurring succession of occasions on which to practice this advantageous formula. By making the calendar an unending cycle of golden opportunities, turning time and talent into treasure will lengthen pharmacy week into pharmacy year.

It not only finds the way to get the trade, it gets the trade into the way of finding it; and the drugless drug store drops over the horizon of notice and concern

forever. As a generator of good will, no circumstance could be more ideal than the merchandizing of pharmacy through turning time and talent into treasure.

If the prevalent disposition to be healthy, or the easy assumption that there is but a set amount of business, seems in any way to limit the opportunity for pharmaceutical service, then it becomes all the more necessary to improve both the survey and the service, which turning time and talent into treasure will do. Merchandizing pharmacy, therefore, means the recognition of the need to be worthy of and to try for patronage, whether much or little of it is in sight. This formula points the way to crystallizing and capitalizing every possibility for business that may be had through both health protection and treatment of disease.

Merchandizing pharmacy gives every opportunity wanted or needed to benefit better from such side-lines as the pharmacist may elect to carry. Merchandizing pharmacy will add more pharmacy to what one already has as readily and as advantageously as the addition of still more side-lines. Let the pharmacist add all the side-lines he wants from auto accessories to zingiber zuzus, but let him not overlook the necessity of turning his pharmaceutical training into treasure, if he is to survive as a pharmacist.

Since progress to be real must be built on favorable fact, and not on factional favor, turning time and talent into treasure will better unite the deserving pharmacists in competent coöperative community, and do more for legislative benefits for both the public and the pharmacist than any effort which to the public looks like help for the pharmacist only. It will find the fundamental economics of every situation, great and small; of the host of little details that are forever marching through the mind. It will find the golden rule in trade restrictions and classification of dealers with regard to the merchandize they may handle. It will answer the drug-store ownership question with satisfactory service to the public and serviceable satisfaction to the pharmacist.

The thesis to turn time and talent into treasure is an inalienable right to self-help and self-security—a tripartite plan of self-organization for personal and professional preferment, that all anti-trust acts approvingly admit.

It will find the way to place the services of the pharmacist above that lethal level where only package and price compete. Turning time and talent into treasure will completely change the competition complex; to take the trade, our contemporaries (call them competitors if we wish) shall need to give a bountifully better service than we do, instead of merely being a cent cheaper than we are.

Turning time and talent into treasure will show the pharmacist how to make his working hours reasonable in length as well as productive of gain. It is the way out of calamitous calm or swamping storm; it will find the failings in a business and fix them; it will stabilize strength into sober sufficiency.

Take the specified ingredients, fitness, faith and functioning ad libitum, use them secundum artem on every problem. The effort of the other fellow to survive, commonly called competition, seems to be accepted by many pharmacists as the gravest of all concerns. But put that "hard nut to crack" between the powerful jaws of this formula and see if the kernel of a satisfactory solution is not at once forthcoming. Take an illustration: Two pharmacies across the street from one another, or side by side, their windows touching; both succeeding. Why? For the simplest of reasons, yet surest! Because the respective proprietors give

attention—alert, aggressive, accomplishing attendance, to the needs of their trade and to the needs of the store. Because they are "up and doing," they are turning time and talent into treasure. Quarrel or no quarrel with one another, each knows that he must work out through the way which he elects to pursue the success that he would attain; just as surely as he must feed himself to get his own nourishment. If, through the allurement of other forms of business, one of them be lead out of his prerogative to practice pharmacy (a mindful man will blame himself not pharmacy), the outcome does not disprove, but instead, confirms the fateful formula. If, on the other hand, the attention of the other has been devoted to the practice of his special training, he becomes all the more securely entrenched in his mercantile situation; and again the formula shows its certainty of deserved result.

Turning time and talent into treasure is the way of salvation for pharmacy to-day as well as to-morrow; its practice to-day improves the knack for to-morrow; its practice to-day improves the profit for to-morrow; and, very properly, it is the preservation of the practice of pharmacy through pursuit thereof for profit.

The mathematical exactness of the formula to turn time and talent into treasure is definitely demonstrated by the fact that the amount of result expressed in terms of substantial success is always directly proportionate to the values of the operating factors and the extended use of them.

Such then is the formula for attaining success in the practice of pharmacy by merchandizing the pharmacist's prerogative and possibilities, as here offered in the slogan "turn time and talent into treasure." Such is the means for regulating the practice of pharmacy and for saving pharmacy to the pharmacist; such the panacea for cut prices, the way to stabilize prices, for making the drug store the local Red Cross, the center of gravity in the community, by inducing the public to try the drug store first, and by a significant service rendered show the customer that the pharmacist is "more than a merchant."

To complete the slogan, "turn time and talent into treasure" by merchandizing pharmacy, to-day, to-morrow, everyday.

DEATH OF M. CAVENTOU IN 1877.

From Chemist & Druggist, 1877.

"Science has lost a great man by the death of Joseph Bienaimè Caventou. In 1820, together with Pelletier, he discovered quinine, one of the most valuable remedies that has been contributed to the repertory of pharmacy. The bark from which the alkaloid is obtained had already become famous, whether under the name of Countess's Powder (the Lady Ana d'Osorio, Countess of Chinchon) or as Jesuit's Bark, so-called from its introduction at Rome by the ecclesiastics who belonged to the Society of Jesus. The story of cinchona bark has been invested with many romantic incidents, most of which had more foundation in fact than similar legends. One thing is beyond a doubt, that the bark having been lauded in terms of extravagance, fell into general neglect, until its use was revived by Sir Robert Talbor, who is said to have sold his secret to Louis XIV. Manifestly it was a grand step to have isolated the active principle of cinchona, and imperishable honor must attach to the name of one who either himself discovered, or actively shared in the discovery of quinine. Two years previously Caventou had isolated veratria; subsequently strychnine, brucine and caffeine were added to the list, and he demonstrated the nature of chlorophyll, the green coloring matter in plants. This last substance is undergoing further important investigation, the nature of which may be learnt from the June number of the '*Microscopical Journal*,' and its references to former work."

ANDREW CRAIGIE, THE FIRST APOTHECARY GENERAL OF THE UNITED STATES.

BY LYMAN F. KEBLER.

(*Continued from p. 74, January* JOUR. A. PH. A.)

DAMAGING LETTERS.

A letter of Dr. John Brown Cutting, assistant apothecary to Dr. Craigie, addressed to Dr. John Morgan reads:[1]

"Sir:

"In November 1775, when you assumed the direction of the hospitals at Cambridge, you found me acting in the capacity of an assistant apothecary. After the most extraordinary and unparalleled dismission of Mr. Andrew Craigie from the head of this department, to make way for an augmentation of your emoluments by the introduction of a pupil of your own, you confirmed me with that character. Upon my expressing a desire to leave the department you strenuously opposed me. Conscious doubtless, of the incapacity of my new superior to fulfill the duties of his station, and of the necessity of some one whose knowledge and services in the profession, might screen the affairs from public notice. Dissuaded from my intention of leaving the department at this time, by some who had the interest of their country at heart, I continued without either the honor or the profit, to perform all the services of Principal Apothecary till October 1776, during which I had twice the satisfaction to save from the enemy all the medicines under my care, when in the most imminent danger, but ashamed that a youth well known to be unfit for that office, however accomplished in other respects, should have the honor of heading the profession while I did his duty and you drew the wages. I again solicited a dismission. The pay of an assistant apothecary at this time was $30 a month. On the seventh of November after I received the following answer from him: Wishing to make it more worth while to serve the public, I make you the offer of the place, it will be on the same footing you have held your present one, my verbal appointment and bearing you on my list of officers, so that you will be bettered only in rank and pay, to deliver out medicines to Regimental Surgeons and must still be subordinate to Mr. Giles.

"To this newly proffered place you made an addition of ten dollars per month, amounting with 30 I had before to 40.

"From the date of this letter I never heard from or saw you, till I obtained my dismission from the department, Dec. 17, 1776, at Philadelphia. Here I received your verbal thanks for my good conduct in general. * * * and in particular, for my extraordinary exertions and vigilance in removing from Newark on the enemies near approach not only all the medicines committed to my charge, but also in the absence of the Senior Surgeon, all the hospital stores * * * to a place of security near Morristown; after you gave me unsolicited the following certificate: 'This is to certify that Mr. John B. Cutting has been employed by the general hospital as Assistant Apothecary ever since my entrance into the service; to October 6th last and from thence to the present day as apothecary; and given entire satisfaction.

John Morgan, Director General.'

Phila. Dec. 17, 1776."

A second letter of Dr. Cutting reads:[2]

"As I have misreprehended facts, I will try to be most just and leave it to those who know them to say how far I deviate from truth. First the affair of Mr. Craigie. When you commenced director of hospitals at Cambridge, 1775, you found the several offices filled by persons diligent and capable. No vacancy appeared for one new appointment to plume your vanity or gratify your avarice. Yet determining the sacrifice should introduce a "Sinecure," the emoluments of which you might reap in security. The principal apothecary's place appeared most eligible. You immediately informed Mr. Craigie who then held it, that Congress knew not his appoint-

[1] Penn. Packet (July 29, 1780).

[2] Penn. Packet (August 6, 1780).

ment and with superlative hypocrisy, affected to regret it; offering at the same time to write to them in his favour. He soon obtained recommendations from all the medical gentlemen of the army and hospital, and trusting to your promise he confided them to your care and, instead, however, of aiding his application, did you not suppress these testimonials and in the most arbitrary manner remove him abruptly from office, without accusation, trial or hearing, or assigning any reason except—I have the power, sir, and it is my will. Having thus forced the door of his office to subserve your own purpose and make a friend of the mammon of unrighteousness, did you not attempt to blast his reputation for no other reason than that of your having already injured him? And were you not detected in this nefarious design and obliged to make him concessions in writing? You may perhaps deny these facts also, but positive proofs are at hand."

Unfortunately these do not appear to be the only instances where Dr. Morgan sought to increase his prestige and emoluments at the expense of his associates. While he was Physician-in-Chief[1] of the Continental Army he is charged with taking possession of certain medicines, depriving the regimental surgeons of their use, by sending them to the General Hospital and thereby increasing his emoluments, because this plan necessitated sending the sick to this hospital.

Patrick Garvey was employed by Dr. Shippen to settle certain accounts. He says:[2]

"Some time in the summer of 1780, being then settling the apothecary general's (Dr. Craigie) accounts a receipt came under my notice for a number of instruments for which I found no order."

Dr. Shippen, whose affair it was, apparently desired the matter to be covered up, but says Garvey:

"I told him * * * that Doctor Craigie had repeatedly given me orders not to erase or alter a single word in his books, which order (I remarked) I was in duty bound to obey."

HIGH CHARACTER OF CRAIGIE.

On December 16, 1780, Dr. Benjamin Rush wrote:[3]

"I can say nothing of Mr. Garvey's character from my knowledge, * * * but the following certificate and letter from Doctor Craigie, the apothecary general of the United States Army, a gentlemen whose character cannot be encreased by anything I can say in favor of his merits as a man, as a public officer, and as a whig, will show in what light Mr. Garvey and his depositions deserve to be viewed by the public."

Extract from Certificate: "He (Garvey) was in the Continental Medical Laboratory. I (Craigie) must add he was friend of country and maintained the character of an honest man."

This certificate is interesting because it establishes a character; because it makes reference to the first government medical laboratory and because it comes from Craigie.

The above tells volumes of Craigie the man. His acts reflect the highest type of honor and character. His associates spoke of him in glowing words. He was an exemplary revolutionary officer.

THE SERVICES OF CRAIGIE.

The exact length of time Dr. Craigie served as Apothecary and Apothecary General of the Revolutionary Army is not on record.

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[1] *Towne's Penn. Evening Post*, p. 223 (Apr. 22, 1777).

[2] *Penn. Packet* (Dec. 23, 1780).

[3] *Penn. Packet* (Dec. 16, 1780).

He became officially connected with the Revolutionary movement in Massachusetts early in 1775. Dr. Church probably appointed him apothecary about August 1st. Craigie was requested to take charge of the Medical store at Watertown, Mass., August 3rd, probably as part of his duties as Continental Apothecary. On December 2nd we still find him Continental Apothecary. The records of the War Department mention him in connection with an account dated January 13, 1776, then apparently stationed at the "American Continental Hospital at Cambridge and Roxbury," when he received 56 pounds for 140 days of service. The medical director forced him out of office about this time. On January 1, 1777, we find him on the payroll as Apothecary General of the Revolutionary Army. On September 5, 1777, the Council of Massachusetts granted him supplies for the general army. His headquarters then apparently were in the northern division. F. B. Heitman says:[1]

"Andrew Craigie, Apothecary General: Continental Army pay accounts for service from January 1, 1777, to December 31, 1780. Andrew Craigie (Mass.) Apothecary Hospital Department, 6th October 1780, to November 1783."

Heitman's data are based on the records of the War Department, and are therefore authentic.

The Adjutant General's office of the War Department on August 10, 1926, writes that Andrew Craigie was on "A list of officials in the Hospitals exclusive of the Southern Department dated at Philadelphia, November 12, 1783."

The above data fail to account for the connection of Dr. Craigie with the revolutionary movement for less than a year but that he rendered patriotic service along the lines of his vocation during this time, there is no doubt. His unfair and abrupt dismissal, by the second medical director, because he wanted the place for a protegé and because "Congress knew not his appointment" would not sway Craigie from the lines of duty as he saw it. This patriotic Whig therefore served in the revolutionary movement from April 30, 1775, to November 1783; a little over $8^1/_2$ years, a service that is exceeded by few if any other medical officer. General Washington received his appointment June 15, 1775, and surrendered his commission December 23, 1783, a service of a little over $8^1/_2$ years.

CRAIGIE REINSTATED.

As pointed out above, discord among the medical staff was acute during Dr. Morgan's term of office. If he treated others as he did Craigie there is little wonder. It is interesting to note that while Craigie surrendered his appointment due to pressure of Dr. Morgan, he was reinstated or reappointed to his office January 1, 1777, about a week before Dr. Morgan and his chief accuser were dismissed by Congress. Why was Craigie restored to his position and who reappointed him? Did Mr. Giles, Morgan's protegé, who replaced Craigie, prove incompetent as pointed out by Dr. Cutting? Did Giles command the respect of the medical corps and the public? Did Morgan not realize that the exigencies of the war required efficient men to provide and be trusted with medical stores and supplies? Did Morgan feel the results of his disingeniousness and restore Craigie to office? Did he think this act would insure to his benefit, at a time when disaster was im-

[1] "Historical Register 1775–1783."

pending? With it all we do not find a single word of retaliation or attack by Craigie. At a later date he writes "I was not made to battle." Speculation is rife but records fail us, as is often the case, historically.

OFFICE OF APOTHECARY GENERAL CREATED.

The Medical Committee recommended[1] a reorganization of the medical department, February 27, 1777. It provided for the office of Apothecary General to purchase medicines . . . and authorized this officer to appoint three assistant apothecaries in different parts of the United States, "in order to supply with more convenience the several hospitals, and Regimental and Naval Surgeons with medicines and instruments." Provided an Inspector General . . to visit the apothecary shops and "to examine the medicines . . ." The surgeons and physicians general of the hospitals to have the liberty of appointing hospital-apothecaries. This bill was amended, passed[2] April 7th, and provided an Apothecary General, for each district with as many mates as the Director General, etc., thought necessary. On April 8th, the Apothecary General's income was fixed at $3 and 6 rations a day. Craigie at this time was serving as Apothecary General and appears to be the only apothecary of record to fill this office, during the Revolution.

It will be recalled that the Navy took form late in 1775 and began to function in 1776. Congress on August 20, 1776, authorized the appointment of "A surgeon for the fleet now fitting out upon the lakes," but the 1777 law contains the earliest reference to "Naval Surgeons," who were to be furnished supplies by the apothecaries.

SMALL POX SCOURGE OF REVOLUTION.

Small pox was the great scourge of the revolution. It was the nightmare of physicians and apothecaries. It raged in Boston during the siege. Small pox was repeatedly sent out of Boston, with the design of spreading the disease among the citizens and the American army. It was one of the weapons used against the colonists. Eternal vigilance was necessary to prevent an epidemic. Dr. Thacher in May 1776, refers to small pox as being in many parts of the town (Cambridge), among both the inhabitants and soldiers.

The colonies generously coöperated in all matters. At a Board of War meeting[3] February 20, 1777, it was "Agreed to report to Congress: * * That the Assembly of the State of Maryland be requested to deliver to Doctor McKenzie so much Medicines of the following Denominations as he shall want and they can Spare, to enable him to inoculate the Continental Troops in this Town, in the following proportions for one hundred Men.

'Six ounces of Calomel
Two pounds Jallop
Three pounds Nitre
Elix. Vitriol
One pound Peruvian Bark
One pound of Virginia Snake Root.' "

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[1] *J. Cont. Cong.* (C. L. Ed.), 7 (1777), 161.
[2] *J. Cont. Cong.* (C. L. Ed.), 7 (1777), 232.
[3] *J. Cont. Cong.* (C. L. Ed.), 7 (1777), 139.

THE FIRST PHARMACOPŒIA IN AMERICA.

The Apothecary General and his associates undoubtedly felt the lack of uniformity in the prescribing, compounding and preparing of medicines for and in the several military hospitals. Uniformity and expedition were greatly needed. How much they contributed to bring about the needed improvements is not known. Dr. Wm. Brown, appointed assistant physician September 1776, was the moving spirit in preparing the first Pharmacopœia in America, sometimes referred to as the Military Pharmacopœia. The first edition was published by him in 1778, while Physician General of the Middle Department, with headquarters at Lititz, Pa.

The book is printed in Latin and it consists largely of prescriptions, both simple and compound. Eighty-four of the prescriptions are for internal medicines and fourteen for external medicines. The first page translated reads:

"Pharmacopœia of Simple and Efficacious Prescriptions for the use of the Military Hospital, Belonging to the Army of the United States of America. Adapted especially to our present state of need and poverty, which we owe to the ferocious cruelty of the enemy, and to a cruel war brought unexpectedly upon our Fatherland."

A freed translation of the preface reads:

"An asterisk denotes such prescriptions, as ought to be prepared and compounded in the general laboratory, the others are to be mixed, as required at the office of the hospitals.

"There are many prescriptions in solid form, which might be more convenient, or, at least, more elegant in liquid form, were there sufficient phials. All preparations of lesser efficacy, or such as are used only for patients because of their elegance, such as simple waters, all unnecessary or little used plasters and unguents because of their inconvenience in transportation are omitted. Lititz, March 12, 1778."

Prescription writing and prescription filling were apparently by this time in different hands. Pharmacy and medicine were separated. In addition to the offices in the several hospitals for compounding prescriptions, there was a general laboratory for preparing medicines and filling certain prescriptions. This was the first pharmaceutical laboratory in the United States. There is no doubt in my mind but that Doctors Craigie and Cutting gave much assistance in working out details for the compounding of the several prescriptions.

The "Second Edition" (practically a reprint) appeared in 1781. In this edition the name of the author appears for the first time. He was no longer in the army. The purpose of the book is clearly shown in a letter written by Dr. Brown to an associate on one of the blank pages of the first edition, in possession of the Pennsylvania Historical Society, and reads in part:

"For the sake of expedition and accuracy in performing the Practice, and also to introduce a degree of uniformity therein throughout the several hospitals, the following Pharmacopœia has been compiled, consisting of such formulae as it is always in our power to obtain; at the same time blank pages are interleaved for the insertion of any favourite or more useful formulae which the prescribers may choose to make use of in addition or in place of any of those herein contained."

The first edition is reproduced in the "First Century of the Philadelphia College of Pharmacy," pp. 86–94 (1922), and a reproduction of the "second edition" will be found in the *Am. J. Pharm.* 56, 483–91 (1884).

Dr. Brown laid the foundation for a national pharmacopœia. The work was interrupted by his resignation July 21, 1780, because "His present circum-

stances will no longer permit his continuance in the service." One wonders if his resignation did not delay by many years the first edition of the United States Pharmacopœia.

MEDICAL MEN GIVEN OFFICIAL STATUS.

Up to October 27, 1779,[1] the medical men were simply ranked as civilian attachés to the military body. They had no official status whatever. On the above date this inequality was rectified.[2] The Apothecary General was given the same rank as Lieut.-Colonel and the Apothecaries' Assistants received the rank of captains.

On November 20th, of the same year the sums for which subsistence could be computed were fixed. The Apothecary General was allowed $400 per month and his assistants $100. This seems a good deal of money for that time but it must be remembered that the Continental money had greatly depreciated. Articles priced at three shillings in specie required $40 in Continental money to buy.

MEDICAL DEPARTMENT REORGANIZED.

The medical department was reorganized[3] by Congressional action September 30, 1780. Certain parts of this law provide: "That there be * * one apothecary; one assistant apothecary; * * to each hospital."

"The Director or * * chief hospital physicians shall * * direct the apothecary or his assistant, to prepare and deliver, medicines, instruments, dressings and other articles in his possession to the hospitals and surgeons of the army or navy, * *."

"That the apothecary and his assistant receive, prepare and deliver medicines, instruments and dressings, and such other articles of this department to the hospitals and army, on orders in writing from the director, or either of the chief hospital physicians or chief physician and surgeon of the army: * *."

"The apothecary shall receive one hundred and thirty dollars per month."

"Assistant apothecaries, each seventy-five dollars per month."

"That the several officers whose pay is established as above * * shall at the end of the war be entitled to a certain provision of land, in the proportion following: The apothecary the same as a Lieutenant-Colonel. Assistant apothecary the same as Major."

Congress reserved the right of appointing and commissioning (p. 885) the principal officers, including the apothecary and the assistant apothecary.

General Washington addressed a letter to a member of Congress recommending a number of appointments, among them Dr. Craigie. His letter of September 9th, reads in part:[3]

"Doctor Craigie, the present Apothecary General, a gentleman not personally known to me, has been reported as very deserving of the appointment. * * The reason of my mentioning these particularly, proceeds from a hint given me, that the new arrangement might possibly be influenced by a spirit of party out of doors, which would not operate in their favor."

The election[4] took place October 7th, and resulted in the appointment among others of Andrew Craigie, Apothecary and Wm. Johonat, Assistant Apothecary.

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[1] *J. Cont. Cong.* (C. L. Ed.), 15 (1779), 1214.

[2] *J. Cont. Cong.* (C. L. Ed.), 18 (1780), 878.

[3] "Medical Department, 1775–1873," p. 58, Harvey E. Brown (1873).

[4] *J. Cont. Cong.* (C. L. Ed.), 18 (1780), 909.

Brown in commenting on the officers elected by Congress at this time says: "Doctors ——— Craigie ——— were already well known to the whole army as surgeons of the very highest character."

The old practice of preparing persons for smallpox inoculation by a course of mercury and a low diet was losing ground. The mercurial anointments caused death in some cases. Extract of butternut came into use as an efficient and valuable laxative about 1781.

CRAIGIE MUSTERED OUT; HIS PROSPERITY AND BUSINESS.

Dr. Craigie served as Apothecary General on the general staff of the army to the end of the war. He was mustered out, some have it, November 3, 1783, but the War Department has him still on a list of officers November 12,1783. During his service in the revolutionary army Craigie acquired a large fortune, buying up government promises and other speculations. This apparently enabled him to engage in the wholesale apothecary trade, on leaving the service, but he did not restrict his attention to it long. In 1784 he began to turn to broader fields of endeavor. The next year we find him sending gunpowder tea to China and elsewhere. He enlarged his interests generally until by 1790, his account books, also fortunately preserved, show multitudinous business connections. He was the modern wholesale druggist, a century ahead of his time.

Dr. Craigie maintained a voluminous correspondence. It probably exceeded that of any other man actively engaged in business during that period. His army experience stood him well in hand. He there realized the necessity of exactness and the keeping of his records for future use. The American Antiquarian Society has some six hundred of his letters in three large volumes. They are referred to as "The Craigie Papers" and "The Craigie Manuscripts." They contain a mine of information on business matters during the first few years of our Republic. The above society was good enough to place one of these autographed letters at my disposal for use in this article and it is reproduced herewith.

This excellent longhand letter to his brother shows some of the business matters that engaged Dr. Craigie. He was still interested in Government securities and was preparing to buy the Cambridge Estate that played such an important part in his life later. "Mamma" Craigie was still living and affectionately remembered. The letter is representative of the transactions of an alert investor and speculator in the early days of our economic and financial history, when Hamilton was funding the national debt and creating the powerful United States Bank. Craigie served as director of the first of these banks, in Philadelphia. He represented accurately the New England attitude in these financial matters.

"The Craigie Papers" have been studied from several angles and the results published by Samuel Swett Green[1] and Archer B. Hulbert,[2] respectively. The information in these papers is freely drawn on in this contribution.

THE UNFORTUNATE OHIO VENTURE.

In 1786 Revolutionary soldiers holding Continental certificates organized an association to purchase a large tract of land on the Ohio river. It was not

[1] "Proc. Am. Antiquarian Soc. N. S.," 13 (1900), 312.
[2] "Proc. Am. Antiquarian Soc. N. S.," 23 (1913), 222.

My dear Brother, New York Sept. 26 - 90

250
1000
73
29.73

Your Letter of the 21st is rec'd — Your having given your obligation to pay the three years extra Interest on the Loan offices Certificates which draw interest on the face provided the same should not be allowed by Government is a circumstance that may make some difficulty as I shall be obliged to part with them without making such condition, if I part with them at all if it is probable I shall part with them. No arrangements have been made for such extra Interest at the Treasury or in any sales of Certificates — had I not better return them to be exchanged, let me know if I understand the matter right & what I had best do.

Inclosed are three Bills for 29.73 Dr. which you will receive & appropriate in the purchase of Specie on the best terms you can but not to exceed 12/8 — They are now from 12/2 to 12/3 & rather falling — you will thank you to lay out for me what monies [illegible] on hand.

I am satisfied with your having made the offer for the Cambridge Estate — As it rests a while - all Circumstances considered I think it were a great effort — he will come to it

I shall not send any more Bills on London at present I wrote you by last post & sent the N Carolina Paper what you sent on for my own trial for your friend - it would not answer.

Perhaps Lane would take the Estate on Long Credit say 2 or 3 years without making a great difference in the price. The use of money is at this moment valuable — I only suggest this for your consideration

My Love to Mamma & all —

Yours ever

Andrew Craigie

Reproduction of Letter. Andrew Craigie—Apothecary General, U. S.

deemed feasible to purchase more than $1^1/_2$ million acres at 66 $^2/_3$ cents per acre, but a Committee of Congress considered the transaction too small. Wm. Duer, the arch New York speculator, then agreed to take and become responsible for $4^1/_2$ million additional acres at the same price. One half million dollars was paid down by the trustees when the contract was signed. Duer supplied one fourth of the money. Andrew Craigie as a friend of Duer became one of the trustees. He went into this scheme in order to strengthen his "union with Duer." Some of the transactions annoyed Craigie. At one juncture he wrote: "You wonder that my caution should come so late.—It was as I thought in season, as soon as I discovered the arrangements you were entering into I wrote you—enough is said * *." The venture proved a dismal failure. Agents sold lands and gave titles to property they did not possess. We still have the unfair method with us. Craigie may not have been concerned financially, but he would have profited largely had the speculation succeeded.

Because of his services in the war, Dr. Craigie was entitled to some lands. On December 30, 1790, Warrant 500 for 450 acres of land in Knox County, Ohio, was issued to him. He assigned it to Robert Campbell who surrendered it with other warrants.

THE VASSAL-CRAIGIE MANSION.

Craigie apparently had in mind purchasing the Vassall estate in 1790. His brother in July 1791 refers to negotiations looking toward its purchase. The property was acquired late in 1791 at a cost of 3750 pounds. A large sum of money in that day, but Craigie was very prosperous then. Bossinger Foster, his brother-in-law, lived in the Mansion for some time. For many years it was known as the Craigie House. Now we know it as the Craigie-Longfellow house. It has not been changed since Craigie's time. All visitors to Cambridge are familiar with this dignified English style country home, painted in yellow and white, with its spacious grounds. This mansion has more historic interest than any other house in New England and with the exception of Mt. Vernon, is probably the best known residence in our country.

The house was in Tory row. The owners of the estates on which these houses stood were aristocratic in their habit and manner of living and were nearly all Churchmen. The house was probably erected in 1759 by Colonel John Vassall, a man of importance in his day. Mrs. Washington visited here while the General made it his headquarters. She came in a coach and four black horses, with postilions and servants in scarlet livery.

Craigie employed a gardener and laid out the grounds in harmony with the period of that day. There were about 150 acres of land at the time. All that remains of the garden itself are the tall hedges and clumps of lilacs on the west side of the mansion. He had a green house and an ice house on the premises; both almost unknown luxuries in those days. Some people thought a judgment would befall one who thus attempted to thwart the designs of Providence by raising flowers under glass in winter and keeping ice under ground to cool the heat of summer. Here we have the forerunners of two great institutions in this country, ice in summer and flowers in winter.

There was a brew house on the place. Craigie laid in ample stores of wine

preparatory to living in Cambridge and continued to buy it thereafter. It is said he added the west wing and enlarged the square northeastern room to its present spacious dimensions, which adorned with stately columns served as a grand dining room. Extensive purchases of furniture, pictures, silver, china, etc., were made for his magnificent establishment.

CRAIGIE MARRIES MISS SHAW.

Dr. Craigie maintained a princely bachelor's establishment. His home became the social center of Boston. Entertainments were on a grand scale, but there was as yet no mistress of the house. This was not to continue long. Josiah Quincy tells[1] this story of Craigie's marriage.

> A great garden party had been given by Mr. Craigie, and all the fashion and beauty of Boston were assembled in his spacious grounds. The day was perfect, the entertainment was lavish, and the company were bent on enjoying themselves. Smiles and deference met the host upon every side, and newcomers were constantly arriving to pay that homage to wealth and sumptuous liberality which from imperfect mortals they have always elicited. "Craigie!" exclaimed an intimate friend to the host, during one of the pauses of compliment, "What can man desire that you have not got? Here are riches, friends, a scene of enchantment like this, and you the master of them all!" "I am the most miserable of men!" was the startling reply. "If you doubt it, you shall know my secret: do you see those two young ladies just turning down the walk? Well, they are both engaged, and with one of them I am desperately in love." There was no time for more, for the crowd again surged round the host, and the friend was left to meditate upon the revelation which had been made. One of the ladies who had been pointed out was a great beauty of the time, and it so happened that Mr. Craigie's confidante was on very intimate terms with her family. It was well known that the match she was about to make did not gratify the ambitious views of her relations. Now whether Mr. Craigie's friend betrayed his secret to the father of this young person cannot certainly be known; but the current report was that he did so. At all events, shortly after the garden party, he broke in upon the Crœsus of Cambridge with an exultant air, exclaiming, "Craigie, I have come to tell you glorious news: the coast is clear; Miss ————has broken off her engagement!" "Why, what the deuce is that to me?" was the disappointing reply. "Good heavens, man, don't you remember telling me that you were desperately in love with one of the young ladies you pointed out at the garden party?" "To be sure I did," sighed Mr. Craigie, "but unfortunately I referred to the other young lady." * * * it happened—or was said to have happened—that "the other young lady" subsequently found good reason to break off her engagement, and, as Mrs. Craigie, came to preside over all future garden parties.

The young lady was Miss Elizabeth (Nancy) Shaw, the handsome daughter of Rev. Bezeleel Shaw (Harvard College, 1762). She was much younger than her husband. Craigie's wealth undoubtedly won the hand of this attractive girl. The marriage took place in Cambridge, January 1793. It was hailed with delight by both families. The marriage, however, did not prove to be a happy one. In spite of every luxury that surrounded Mrs. Craigie, she gradually became estranged from her husband, who was deeply immersed in his land speculations.

SOCIAL FUNCTIONS MORE BRILLIANT.

The hospitalities were lavish and very generally accepted. Over one hundred guests were at times entertained at the brilliant commencement festivals. Prince Edward, the father of the beloved Queen Victoria, was entertained by the Craigies. The merchant princes of Boston enjoyed their splendid hospitality. Talleyrand,

[1] Figures of the Past, by Josiah Quincy, p. 25 (1883).

a prince of diplomats, with whom Mrs. Craigie could converse in his native tongue, was numbered among their distinguished guests.

Entertainments without table pleasures would have lost much of their attractiveness. Little is recorded of the food supplies and viands. We know there was an abundance of wine in the cellar, a grand dining room, plenty of table furnishings and much land. The Craigies' had flowers in winter and ice in summer. Green frog legs were then well known. Fowls were imported from Philadelphia, where the doctor spent part of his busy days. He probably well knew the toothsomeness of the Philadelphia Capon. There were twelve servants. Deliciously prepared and wholesome foods were probably in keeping with the rest of the profuseness.

THE CRAIGIE BRIDGE.

About the time Craigie took up residence in Cambridge a great speculation in lands was going on in Cambridgeport. A similar enterprise was undertaken at Lechmere point in which Andrew Craigie was the prime mover. He purchased land from January 1795 to May 1807. It was done with great secrecy. His name did not appear in the records until the whole scheme was completed. At the latter date he owned about three hundred acres of land in two parcels, one of which included almost the whole of East Cambridge.

On May 12, 1808, the Governor of Massachusetts signed an act which completed the legislation necessary to enable Craigie and his associates, to build Canal or Craigie Bridge from Lechmere Point to Boston. This bridge was opened to the public on Commencement Day, August 30, 1809. The festivities at the Craigie mansion were unusually brilliant and the guests jubilant on that occasion. The opening of this bridge was the nucleus for opening roads to Cambridge Common, to Medford and elsewhere. It also brought travel from the country to Boston.

This bridge was the inspiration of the lines of Longfellow:

> "I stood on the bridge at midnight,
> As the clock was striking the hour."

After a time Andrew Craigie's glory waned. He became heavily involved financially and was compelled to live as well as he could in reduced circumstances. His spacious living had come to an end. A visitor, while walking with him through the large and handsome rooms, struck with admiration, exclaimed, "Mr. Craigie, I should think you would lose yourself in all this spaciousness." Mr. Craigie replied, "I have lost myself in it." He never came back.

He finally became so heavily burdened with debts and overwhelmed with judgments that he was obliged to remain in his home property, his castle, for six days in the week to avoid arrest. On the Sabbath he was free to go abroad. He used this liberty to attend Christ Church, whose warden he was in 1796. Craigie supported the church in its adversities. The church became a comfort and solace to him in his reverses.

Dr. Craigie died Sunday, September 19, 1819, of apoplexy, aged 76, and was buried in the old tomb of the Vassall family which he bought with the house. Thus endeth an unusual career of one who had abundant wealth, spent it freely entertaining friends, diplomats and royalty, lived in opulence, met with reverses and died almost friendless in adversity.

There were no children. Mrs. Craigie survived her husband by many years. The estate was much encumbered. Her income was small. She at once began to retrench by reducing the number of servants from twelve to two, with whom she lived a lonely life in the rear portion of the house and rented all the rooms in the main building.

In May 1841, Mrs. Craigie died. She had lived alone and was buried alone, in Mount Auburn cemetery. Her monument, typical of her philosophical mind, is a Grecian altar, surmounted by a flame. It is unnamed but bears the following lines from Voltaire, of whom she was a great admirer: "As flame ascends, the vital principle aspires to God."

In 1844, the Honorable Lemuel Shaw, her nephew, Chief Justice of the Supreme Judicial Court of Massachusetts, applied as executor for the pension due to Elizabeth, widow of Andrew Craigie.

In addition to the references citied in the body of this biography, the following literature has been consulted:

The Craigie House by Alice Longfellow, *Cambridge Tribune* (April 21, 1900).
"Life of H. W. Longfellow," by S. Longfellow.
"The Medical Men of the Revolution," J. M. Toner (1876).
"New York Society of Cincinnati," (1886).
"Massachusetts Solders and Sailors in the War of the Revolution."
"Annals of Medical History," Wm. O. Owen, Vol. 1 (1917).
"History of Cambridge, Mass.," R. L. Paige (1877).
"Publication of Colonial Society of Mass.," Vol. 7 (1905).
"An Historic Guide to Cambridge," Hannah Winthrop Chapter, D. A. R.
"The Cambridge of 1776," done by Divers Eminent Hands (1876).
"Memorials of the Massachusetts Society of the Cincinnati," James W. Bugbee (1890).
"The Medical Department of the United States Army during the Period of the Revolution," Col. W. O. Owen (1920).
"Correspondence with the U. S. War Department and Department of the Interior."

In closing this sketch I want to thank Miss C. M. Davis for the support and assistance she has given me in its preparation.

BARIUM CONTRAST MEAL, FOR INTERNAL USE.

Barium sulphate, 75 Gm.; cocoa powder, 10 Gm.; sugar (powder), 10 Gm.; tragacanth (powder), 5 Gm.; vanillin, .1 Gm.

CHINESE SUMACH USED IN ANTHELMINTICS.

Ailanthus glandulosa Desf., also known as Chinese sumach, tree of heaven, tree of the gods, Ailanta Götter-baum, is indigenous to and a native of North China, where the powdered bark has been used successfully against tape worm. The bark is also very popular in China as a remedy in dysentery and other bowel complaints. It is used in the United States as an ingredient in vermifuges and veterinary medicines. By the action of alcohol, there is obtained from the bark an oleoresin which has the consistency of tar, which substance purges, but rarely acts as an anthelmintic.

ULTRAVIOLET SPOILS FOOD FOR YEAST.

Experiments performed at Ames, Iowa, by Drs. J. W. Woodrow, A. C. Bailey and E. I. Fulmer of Iowa State College show that if the flasks of nutrient liquid in which the minute plants are subsequently to be grown are exposed for a number of hours to the invisible radiations, they become definitely poisonous to the yeast cells, markedly increasing their rate of growth.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

THE PSYCHOLOGY OF EFFECTIVE DISPLAY.

(*Continued from January* JOURNAL.)

If a display is to succeed, the first thing it must do is to attract attention. In preceding articles in this series I have undertaken to explain the various principles and devices which may be employed effectively to attract attention to a display.

Merely to attract attention, however, is not sufficient. A display also must hold the attention it has attracted. It is one thing to see a display and quite another to look at it. While casual and passing glances do make impressions, the most productive and resultful are those which represent earnest concentration of mind.

We climb the entrance steps to our offices a dozen times a day, year in and year out. Yet, try as we will, we can't tell how many steps there are in this flight of stairs we climb so often. This is as it should be, for if we were to clutter our memories with such useless impressions and facts, there wouldn't be much room left for the meaningful and worthwhile.

It is easy to see, however, that if window and store displays get no more attention than the office steps we climb a dozen times a day, these displays cannot possibly be very productive. They would get some casual attention, to be sure, which eventually would build into the minds of passersby a consciousness of what is being displayed. Remember, though, that we don't have the frequent daily contact with the displays of stores that are trying to sell us something that we do with anything so familiar as the office entrance steps.

Attention, once attracted, can be held to displays by various devices and principles. As in the case of the ways by which attention is attracted to displays, these devices and principles are of two general classes: first, mechanical, which is effective regardless of what is displayed; and, second, interest, which is a result of the inherent attention qualities of whatever is being displayed.

Consider first the mechanical devices and principles. The first of these is unity. By unity is meant the singleness of purpose of a display. For instance, a window full of hair brushes certainly has unity. The one and only object of that window is to create interest in and desire for hair brushes.

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* Instructor of Merchandizing, Wharton School of Finance and Commerce, University of Pennsylvania, Lecturer on Business Administration, Philadelphia College of Pharmacy and Science.

If the window contained also candy, cigars, perfume and crude drugs, it is apparent at once that the unity of the window would be destroyed. It is too long a mental jump from hair brushes to candy, to cigars, to perfume, to crude drugs. The result is people don't get a clear impression of anything, or at least what impressions they do get are gotten with infinitely more difficulty. Consider how difficult it would be to learn anything from a textbook on the pages of which there was an inextricably mixed hodge-podge of five or six unrelated subjects. Displays are intended to be educational—to acquaint people with the merchandise a store has to sell and create in these people a desire to have this merchandise. A display, therefore, must have unity if it is to hold a person's attention with a minimum of effort and a maximum productiveness.

A display doesn't need to be confined to one single kind of merchandise in order to achieve this essential attention-holding factor called unity. Related merchandise may be and frequently should be shown with the merchandise which is the feature of the display. Just as a textbook gradually leads its readers into more and more complicated and diversified subject matter, so may a display effectively introduce related merchandise.

In the case of the hair brushes just cited, any druggist knows that the merchandise to display with them includes such items as combs, other kinds of brushes, and toilet preparations for the hair. Without sacrificing to an important degree the drawing power of the featured articles in the display, items which are readily associated with them can be displayed incidentally and the possibilities of increasing their sale increased accordingly. More business is thus to be had from the same display without sacrificing the essential attention-holding principle of unity.

Some people may wonder what the unity is in a window display of four dozen different kinds of home remedies and patent medicines, each with a large price tag conspicuously attached. The object of such a display is to convey to passersby the apparent bargains to be had in the store on a wide variety of home remedies and patent medicines. The unity is not in the merchandise, but rather in the bargain appeal. That is the one dominant note of the display which unifies it.

A second mechanical principle which helps a display to hold attention is restriction. The intent of restriction is to confine a person's attention to one display until he has observed the display long enough for it to make an impression on him.

As I mentioned in the case of unity, a person receives only a blurred impression or no impression at all when a display is not unified and shows objects totally unrelated.

Exactly the same result is obtained if a display lacks restriction. This is because the eye, when not restricted, wanders from one thing to another within the range of vision and these things within the range of vision at one time are most likely totally unrelated to each other. For a display to make the strongest possible impression it should have at one time undivided attention. Mechanically it should be so constructed as to hold a person's attention just as long as necessary to accomplish the purpose of the display. The display should be so constructed that nothing in it will tend to cause a person's attention to wander away from it.

Now the question is, how is restriction accomplished in a display? In general, the display should be so constructed that from whatever angle it may be seen the effect is to draw the eye toward the center or middle. That is, to draw the eye

directly to the most important part of the display and also at the farthest distance from competing attractions.

In type, parentheses are used to set off words, phrases and even sentences which are intended to stand by themselves. Recall that the shape of the left-hand mark is bowed to the left in the center, while at the top and bottom the ends point toward the matter which is inclosed—the matter which it is intended to set apart from the rest of the page.

Similarly, the right-hand parenthesis is bowed to the right in the center and the top and bottom ends point toward the matter which is to be inclosed.

Now suppose that the positions of these marks are reversed. The right-hand mark is placed at the left and the left-hand mark is at the right. Exactly the opposite to the intended effect is obtained. The mark at the left tends to draw the eye to left and away from the bracketed matter and, similarly, the mark at the right tends to lead the eye right on out of the bracketed matter into the following matter from which it originally was intended to be set apart.

From this simple illustration, it is apparent, I am sure, that a display should be so laid out that it tends to confine the eye, once attracted, within the space occupied by the display.

A grocer once disregarded this principle of restriction in the following way. He had a life-size cut-out of a jolly, fat butcher in his window, as one of the figures in a very attractive display calling attention to his meat market. The figure of course was large and, accordingly, was placed at one side of the display. Unfortunately, the jolly butcher's head was turned away from the display of which he was intended to be a part; in fact he pointed directly to the display of a competing butcher next door!

The whole effect of restriction is to place a display in a frame which sets it apart and distinguishes it from the surrounding things which all the time are competing for attention.

Closely allied with restriction as a mechanical principle which helps to hold attention to a display is direction. The effect of direction is to lead the eye from whatever it may chance to catch sight of in the display to the things which the merchant wants it most to see.

The most common device to accomplish this purpose is an arrow. In fact, the use of the arrow is so frequent that it has lost some of the distinctiveness that any device used in a display should have.

Ribbons and streamers are used frequently for the same purpose. A confectioner sought an unusual way to call attention in a display to the fact that the ingredients in his candies came from all over the world. He arranged attractively in his window the dishes containing each of these ingredients and as a background he used a map of the world. Then he ran bright colored ribbons from the various dishes to the spots on the map from which they came.

In reading, our eyes move from left to right and from the top to the bottom of the page. Reading is such an important part of modern life that our eyes habitually move in this direction. Long continued habit has made that natural. Movement in any other way consequently requires extra effort. A child can recite the alphabet as rapidly as he can talk, but when asked to recite it backward,

the chances are he won't be able to do it at all. Although not as apparent, eye movements which are contrary to habit are similarly difficult.

The connection of natural eye movement with the principles of display is this. Displays should be so constructed that, wherever possible, the natural eye movement can be followed. We all would have trouble reading a printed page or studying an advertisement which disregarded the usual eye movement: left to right and top to bottom. Don't expect people to spend much time following the sequence of a display which disregards this principle.

For instance, don't expect people to start at the bottom of a display and then move their eyes gradually upward as they take in the various aspects of the display. Take advantage of the way people's eyes naturally follow things and arrange displays accordingly.

(*Another article in this series will appear in the March issue.*)

THE RELATIONSHIP OF MEDICINAL WHISKY TO THE NUMBER OF DRUG STORES AND THE REGISTRATION IN SCHOOLS OF PHARMACY.

BY J. G. BEARD.

For some years now many people have been assuming that the sale of whisky on prescriptions is partly responsible not only for the increase in the number of drug stores in "Whisky States" but for the enlarged enrollment of students in the pharmacy schools of the same states. For example, some time back the pharmaceutical press and public made frequent reference to the great increase in drug stores in New York state, and in every case blamed medicinal whisky for the growth. Other illustrations have been cited to show that legal permission to dispense whisky heightens the urge to engage in the drug business to such an extent that not only more persons enter pharmacy schools but more stores are opened to take advantage of the lucrative business of whisky selling.

This writer believed that there was more fallacy than fact in many of the assumptions made, and acting on this belief he recently made inquiry of responsible pharmacists in every state to find out what relationship, if any, exists between prescription-whisky and store and student increase. The results of this inquiry seem to show that whisky *per se* has little to do with the growth in numbers either of stores or of students. It is true that facts and figures from a few states give affirmation to the idea that whisky is a controlling factor, but data from other states are directly contradictory, and from still other states no significance can be read into the returns. Taking the country as a whole one gathers that a change in merchandizing methods and a growing demand for neighborhood drug service are the factors responsible for the increased number of drug stores. As the number of stores grows greater and as prerequisite laws become more widespread it follows as a necessary sequence that the enrollment in pharmacy schools should become correspondingly larger. These natural causes and not whisky are responsible for more drug stores and more pharmacy students.

The foregoing conclusions become more plausible when one studies the facts and figures to be appended below. The data that will be quoted came from officials

of schools of pharmacy, about 90 per cent being from the heads of the 64 colleges of pharmacy in the United States that answered the questionnaire.

It is perhaps well to insert at this point parallel columns showing the states that allow and the states that forbid the sale of whisky on physicians' prescriptions.

Group I. Medicinal whisky allowed.		Group II. Medicinal whisky forbidden.	
California	New Hampshire	Alabama	North Dakota
Colorado	New Jersey	Arizona	Oklahoma
Connecticut	New York	Arkansas	Oregon
Illinois	Ohio	Delaware	South Carolina
Iowa	Pennsylvania	Florida	Tennessee
Kentucky	Rhode Island	Georgia	Utah
Louisiana	South Dakota	Idaho	Washington
Maryland	Texas	Indiana	West Virginia
Massachusetts	Vermont	Kansas	
Michigan	Virginia	Maine	
Minnesota	Wisconsin	Mississippi	
Missouri	Wyoming	Nebraska	
Montana	District of Columbia	New Mexico	
Nevada		North Carolina	

It is thus seen that 26 states, or 54 per cent, plus the District of Columbia, permit the sale of whisky on prescriptions, and 22 states, or 46 per cent forbid such sale.

If allowing whisky to be dispensed on prescription leads to an increased number of stores and students, one would naturally expect that the growth in the states of Group I (the "wets") would be appreciably greater than those in Group II (the "drys"). But is it?

The college deans were asked to designate whether drug stores in their respective states were growing more or less numerous and whether this increase or decrease was "slow," "steady," or "marked." Their answers show the following facts:

I.—In 26 states allowing the sale of medicinal whisky there is, with two exceptions (Virginia and Minnesota), a growth in the number of stores. In 10 of the states this growth is "steady;" in 7 it is "slow;" in 2 (as noted above) there is a decrease and in 7 the degree of growth was not indicated. In no case was there a "marked" increase, according to the deans.

II.—In the 22 states forbidding the sale of medicinal whisky we find that 6 have had a "steady" increase of stores, 6 a "slow" increase, and 3 have experienced no change. In 6 states the rate of growth was not indicated.

Comparing the above returns we find that the states of Group I are showing a somewhat greater increase in drug stores than are the states of Group II. But can this greater growth be attributed to whisky? The reader is asked to look back for a moment at the two columns of states and note the character of each. Without suggesting obnoxious comparisons we nevertheless must see that Group I contains states that on the whole are showing greater progress than are the states in Group II. Not only are they setting up more drug stores but they are establishing more factories, more schools, more roads, more of everything that in modern times is

thought of as important. In other words it would be a matter of surprise if the deans in Group I states had *not* reported a greater increase in drug stores than Group II deans. So much for the relationship of drug-store growth to whisky.

Turning now to the changes in the student enrollment in the 64 colleges covered by this report. The deans in these colleges were asked this question: "What percentage change is shown in the total enrollment in your school this year over the corresponding period of last year?"[1]

The replies show that 37 schools have an enrollment greater this year than last; 13 have a smaller enrollment; while 14 show no change over last year. In other words, of the 64 schools of pharmacy in the United States, 57.8 per cent showed a student gain this year, 20.3 per cent showed a loss and 21.9 per cent remained the same numerically.

The increases range all the way from 1.3 per cent at the California College of Pharmacy to 84 per cent at Meharry Medical College. (Birmingham Southern College reported a 150 per cent increase but the school was only started in January 1927, and this is really the first full year of the school's activity.)

Here are the 37 colleges that showed a gain. Those in "Whisky States" will be italicized to make later comparisons easier.

Per Cent Gain.	Name of College.	Per Cent Gain.	Name of College.
1.33	*California College of Pharmacy.*	21.	*University of Southern California.*
2.	*University of Montana;* University of West Virginia.	22.	*Indianapolis College of Pharmacy.*
3.	Medical College of Virginia.	24.	*New Orleans College of Pharmacy.*
4.	University of Oklahoma.	25.	*University of Pittsburgh; College of City of Detroit; University of Maryland.*
4.5	*Columbia University.*	30.	*George Washington University; Ohio State University.*
5.	State College of Washington; University of North Carolina.	33.	*Louisville College of Pharmacy.*
7.	Creighton University.	35.	*University of Illinois; St. Louis College of Pharmacy.*
7.75	University of Tennessee.	36.	*State University of Iowa.*
10.	Purdue University; North Dakota Agricultural College; *Rhode Island College of Pharmacy.*	44.	Medical College State S. C.
12.	University of Washington.	58.	*University of Texas.*
13.	*Western Reserve University.*	84.	Meharry Medical College.
15.	*New Jersey College of Pharmacy.*	150.	Birmingham Southern College.
20.	Notre Dame; University of Florida; *Detroit Institute of Technology.*		

The Philadelphia College of Pharmacy and *Temple University* both reported "Increase," but offered no percentage figures.

It will thus be seen that 23 of the gainers are in "wet" states and 14 are in "dry" states.

Seven of the deans who reported gains stated that the increases were due to the three-year minimum course in pharmacy that for the first time this year caused three classes to be in college at one time instead of two as heretofore.

[1] The date of the inquiry was Nov. 7, 1927. Every school but one (Mercer) answered. There may be more than 65 incorporated schools in the country but this writer knows of only that number.

The following 13 colleges show a decreased enrollment this year over last.

Per Cent Loss.	Name of College.	Per Cent Loss.	Name of College.
2.	Southern College of Pharmacy.	16.	*University of Michigan.*
3.	*University of Colorado; Mass. College of Pharmacy.*	20.	University of Kansas.
3.2	North Pacific College of Pharmacy.	23.6	Valparaiso University.
12.	*Fordham University.*	29.5	*Baylor University.*
15.	University of Nebraska; *University of Buffalo.*	40.	University of Utah.
		50.	University of Georgia.

Six of the losers are in "wet" states; seven are in "dry" states.

The following 14 colleges report that no change took place in the size of their student bodies this year:

Alabama Polytechnic Institute, *Howard University, Tulane University, University of Minnesota,* University of Mississippi, *Kansas City College of Pharmacy, Albany College of Pharmacy, Brooklyn College of Pharmacy, Ohio Northern University, University City of Toledo, Cincinnati College of Pharmacy,* Oregon Agricultural College, *State College of South Dakota, University of Wisconsin.*

Eleven of the above are in "wet" states while three are in "dry" territory.

It hardly seems possible from this data to establish the point that the sale of medicinal whisky has any particular bearing either upon the growth of drug stores or the number of persons studying pharmacy. If the state is progressive and business and industry within it are expanding, then drug stores—and pharmacy students to man them—become more numerous irrespective of whether whisky is a commodity dispensed or tabooed. Whisky has done a host of things to pharmacy, most of them bad, but taking the country over, it has had no particular effect upon the number of drug stores nor has it added very greatly to the personnel. Oftentimes it has changed the character but seldom has it changed the census of pharmacy.

* * * * * * *

Nothing said in the forgoing article should be construed as meaning that the author favors the sale of medicinal whisky. On the contrary he abhors it almost violently and is on record frequently in opposition to such sale. In this instance he was not arguing for or against whisky on prescriptions but simply refuting a popular idea that whisky is responsible for the recent increase in drug stores and pharmacy students.

Chapel Hill, N. C., January 22, 1928.

BILL TO PREVENT DIPLOMA MILLS.

Representative Gibson has introduced a bill in the House of Representatives which would prohibit any institution in the District of Columbia from conferring any degree except by license from the board of education. The board of education would be prohibited from granting any such license until it had established evidence on four points: (1) that the trustees or directors of the institution are persons of good repute and qualified to conduct an institution of learning; (2) that a degree shall be granted only after such a period of residence and quantity of work as is usually required by reputable institutions; (3) that applicants for degrees possess the usual high school qualification, and (4) that the faculty is of reasonable number and properly qualified, and that the school have suitable laboratories, class rooms and library equipment.

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

A. C. Taylor, President, Washington, D. C. J. W. Gayle, Treasurer, Frankfort, Ky. Lucius L. Walton, Chairman of Executive Committee, Williamsport, Pa. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Iowa	Nebraska	South Carolina
Arizona	Kansas	Nevada	South Dakota
Arkansas	Kentucky	New Hampshire	Tennessee
Colorado	Louisiana	New Jersey	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming
Indiana	Montana	Rhode Island	

COMMITTEE APPOINTMENTS.

President A. C. Taylor recently appointed the following committees to function and report to the 1928 convention which will probably be held the week of August 20th at Portland, Maine:

Legislative Committee.

A. H. King, *Chairman*, Manhattan, Kansas
John O. Bosley, Wilmington, Del.
I. W. Rose, Rocky Mount, N. C.

Committee on National Legislation.

W. T. Kerfoot, Jr., *Chairman*, Washington, D. C.
Robert L. Swain, Baltimore, Md.
H. C. Littlejohn, Leesburg, Va.

Committee on Constitution & By-Laws.

W. M. Hankins, *Chairman*, Daytona, Florida
James L. Dow, Lancaster, N. H.
Hal E. Duncan, Birmingham, Ala.
Frank Haymaker, Clarksburg, W. Va.
E. H. Walsdorf, New Orleans, La.

Advisory Publicity Committee.

Robert P. Fischelis, *Chairman*, Trenton, N. J.
J. P. Jelinek, St. Paul, Minn.
Bernard M. Keene, Indianapolis, Ind.
H. W. Reuter, St. Louis, Mo.
Frank S. Ward, Portland, Ore.

N. A. B. P. Committee on Prerequisite Legislation.

(To act with similar committees from A. PH. A. and A. A. C. P.)

Wm. R. Acheson, *Chairman*, Cambridge, Mass.
E. J. Boberg, Eau Claire, Wis.
E. P. Carswell, Gorham, Maine
H. C. Christensen, Chicago, Ill.
C. F. Gilson, N. Providence, R. I.

N. A. B. P. Committee on Relations of Boards with Colleges.

(To act with similar committee from A. A. C. P.)

W. H. Cousins, *Chairman*, Dallas, Texas
Wm. H. McNeill, Midland Park, N. J.
Alex Reid, Detroit, Mich.
D. S. Whitehead, Boise, Idaho
A. R. Williams, Aberdeen, S. Dak.

Committee on Standards and Requirements for Classification of Colleges.

A. L. I. Winne, *Chairman*, Richmond, Va.
S. C. Davis, Nashville, Tenn.
H. L. Haussamen, Grafton, N. Dak.

D. L. C. Hover, Cloudcroft, N. Mex.
C. F. Kramer, Harrisburg, Pa.

Committee on Drug Store Ownership Laws.

Jacob Diner, *Chairman*, New York City, N. Y.
G. D. Duncan, Franklin, Ky.
G. V. Kradwell, Racine, Wis.

Grievance Committee.

E. V. Zoeller, *Chairman*, Tarboro, N. C.
A. C. Ellerbe, Florence, S. C.
Claude McVickers, Gothenburg, Nebr.
Guy Norton, Tacoma, Wash.
W. H. Saunders, Lyndonville, Vt.

Committee on National Certificate.

H. C. Christensen, *Chairman*, Chicago, Ill.
C. M. Anderson, Oklahoma City, Okla.
F. M. Clark, Ely, Nevada
A. E. Roedel, Cheyenne, Wyo.
J. W. Seiden, Lewiston, Mont.

DISTRICT MEETINGS.

Five of the nine districts are busily making plans for joint meetings with college faculty representatives this spring.

District No. 4 (Minnesota, Iowa, North Dakota, South Dakota and Nebraska) is planning conferences during the Great Northwest Drug Show to be held February 28th, 29th and March 1st, 2nd at Des Moines, Iowa.

District No. 2 (New York, New Jersey, Pennsylvania, Delaware, Maryland and District of Columbia). Chairman Richardson called a preliminary meeting on January 25th at the offices of the Maryland Board of Pharmacy in Baltimore to outline plans for holding a joint district meeting. Several members of the Maryland Board, college faculty representatives and President A. C. Taylor were present. Baltimore was selected as the place for holding the meeting and the date designated as March 5th and 6th. The conference will consume two entire days, and all sessions will be joint sessions unless the need for divided meetings to take separate action should arise. The program planned includes discussion of examination questions and subjects to be added to the college curriculum.

District No. 6 (Arkansas, Kansas, Missouri, Oklahoma and Texas) has announced a meeting for March 20th and 21st at Hot Springs, Arkansas.

District No. 7 (Alabama, Georgia, Florida, Louisiana, Mississippi) has tentatively set the date for its meeting as April 10th and 11th at Birmingham, Alabama.

District No. 3 (Ohio, Kentucky, Indiana, Illinois, Michigan and Wisconsin) decided during the St. Louis convention to hold its district meeting this year at the N. A. B. P. Secretary's office in Chicago the week of the Executive Committee meeting. The date for that meeting has not been definitely decided, but will probably be fixed for the last week in April or early in May.

GOVERNOR COMPLIMENTS BOARD.

Governor A. Harry Moore of the State of New Jersey, in his annual message to the legislature on January 10, 1928, made the following reference to the Board of Pharmacy:

Board of Pharmacy.

"This admirable Board is striving hard, under serious handicaps, to protect the people of our State.

"The work of the medical man can only be completely effective through efficient and dependable pharmaceutical coöperation.

"In order to facilitate this Board in the work of safeguarding the people, I would ask your careful consideration of its suggested legislation."

This proposed revision of the law provides for annual registration of drug stores; annual renewal of pharmacist and assistant pharmacist certificates instead of biennial as at present; giving the Board jurisdiction over the sale of drugs, medicines and poisons by manufacturers and wholesalers to retail dealers; increasing examination fee to $25.00; giving the Board power to conduct hearings, subpoena witnesses and impose penalties for violations, subject to review by a proper court of law; revision of poison schedule.

PERSONAL AND OTHER NEWS.

In the election of D. F. Jones as President of the AMERCIAN PHARMACEUTICAL ASSOCIATION, an honor is conferred upon another N. A. B. P. member. Mr. Jones was a member of the South Dakota Board of Pharmacy from 1908 to 1913, and by virtue of that fact is an honorary member of the N. A. B. P.

Since his graduation from Northwestern University School of Pharmacy in 1892, he has taken an active part in matters pharmaceutic, and has filled many responsible positions in State and National organizations. He is eminently fitted for the presidency of the A. PH. A. and a successful administration is predicted for him—one which will reflect credit both upon the ASSOCIATION and himself.

Secretary H. C. Christensen was reëlected as a member of the A. PH. A. Council for a term of three years.

Sickness is not good news, but we have learned that two of our Alabama Board members are taking a rest cure after a spell of illness. W. E. Bingham, Vice-President of N. A. B. P. District No. 7 (also Secretary of the Alabama Board) is at his daughter's home in Decatur, Georgia, convalescing. W. P. Thomason, Treasurer of the Board, has been confined to his home in Guntersville since shortly before Christmas. The many friends of our Alabama members join in wishing them a speedy recovery.

W. P. Loesch, Secretary of the South Dakota Board of Pharmacy, is operating a radio broadcasting station in Oldham, S. Dak., his home town, and furnishes entertainment every Friday night for his many customers throughout the State.

Thus the N. A. B. P. adds a new interest to its galaxy of sportsmen. Bridge and golf fans we have many; fishermen and hunters by the score; one member devotes his leisure time to running a rabbit farm. And now we welcome a radio broadcaster. Please report omissions!

STATE BOARD ITEMS.

Alabama.—The crop of candidates has been very small, due to the fact that Alabama went to a three-year graduation requirement in 1927, and therefore, no examination has been held recently.

It is planned to hold an examination some time early in June, just prior to the State Association convention. The convention itself will be held on a specially chartered steamer en route from Savannah to New York.

Reciprocal registration was granted during January to Gilbert P. Plott of Arkansas and J. C. LeHardy of Georgia.

Colorado.—Double the usual number of applicants were examined at the January 27th and 28th meeting of the Board. A late count just before the meeting showed 110 applications.

Connecticut.—The January examination took place on the 10th and 11th at the State Capitol, Hartford. The registered pharmacist examination was written by thirty-eight applicants and the assistant by twenty-one. The next JOURNAL will contain a report of the results.

Idaho.—Eleven applicants were examined at the January 17th and 18th meeting. Grading of papers has not been completed, so results cannot yet be announced.

The following were registered by reciprocity: Elmer Tucker, Lloyd Harris and John

J. Farrell, all of Oregon; G. W. Blackhurst, of Utah; A. W. Johnson, of North Dakota; Guy E. Davis and Wesley D. Kessler, both of Washington; J. W. Bissell, of Missouri.

Kentucky.—At the meeting of the Kentucky Board of Pharmacy held in Lexington on January 10th, twenty-five applicants for registered pharmacist license were examined, and nine of this number succeeded in passing. Five wrote the assistant examination and two of these candidates also passed.

The following qualified for registration by reciprocity: W. Bertram Butler and Marshall T. Bryant, both of Missouri; Posey W. Cooper of Indiana; Herman A. Humphrey, of Ohio; Roy Walter Mercer, of Illinois; J. Dewey Thomason, of Tennessee.

The next meeting of the Board will be held at Hopkinsville on April 10th.

Oregon.—Reciprocal registration was granted to five pharmacists from other States during December. They are: Abram D. Morgan, of Washington; Charles Andrew Collier, of North Dakota; Benj. E. Whisenand, of Wyoming; George W. Shelton, of Oklahoma; and Robert Hart, of Massachusetts.

South Carolina.—The Board will hold an examination meeting at Gaffney, South Carolina on March 21th.

The State association will meet in annual convention at Isle of Palms, S. C., June 13th, 14th.

Virginia.—It is expected that announcement will be made some time before March 1st of the appointment of a new member to fill the term expiring on that date.

The annual meeting of the Board will be held in Richmond on the last Monday in April.

Wisconsin.—Out of the one hundred and ten candidates writing the January examination, thirty-eight candidates were successful, sixteen receiving the registered pharmacist certificate and twenty-two the assistant license.

The next meeting will be held in Madison on Monday, April 16, 1928. All applications must be in the hands of the Secretary on or before April 5, 1928.

THE PHARMACEUTICAL SYLLABUS COMMITTEE.

BULLETIN III.

21. Pages and paragraphs of the present series of bulletins will be numbered, from the start, and members are requested to preserve the series. The paper fits several commonly used makes of ring binders.

22. Members and associate members are urged to send their views on questions discussed in the bulletins, promptly, as the Chairman wishes to direct our decisions in accordance with the consensus of opinion, and questions may be submitted to vote of the Committee two weeks after expressions of opinion on them are asked for.

23. Two members, in discussion of the contents of Bulletin II, have brought up the possibility of the adoption of a minimum four-year course in pharmacy, and expressed the opinion that we should anticipate this in the next edition of the Syllabus. Accordingly, this subject will be discussed here. Referring back to the fourth paragraph of Bulletin II, on the duties and powers of the Committee, we see that the Committee does not possess the power to adopt a four-year course, which this would amount to. The Syllabus will need frequent revision in the future, as it has in the past, and, when a four-year course is in effect, it will be the duty of a future Committee to prepare a four-year Syllabus. Nevertheless, the possibility of the adoption of a four-year minimum course should be kept in mind, as we do our work.

24. To undertake the preparation of a four-year Syllabus now would inevitably lead to a bitter controversy and the Chairman rules that the present Committee is to prepare a Syllabus for the present three-year minimum course in pharmacy, keeping in mind that a minimum four-year course may be adopted before many years are past.

25. Various individuals will soon be requested to prepare outlines of subjects and these will be submitted, separately, for consideration and constructive criticism. They will then be revised and re-submitted, before they are adopted.

26. The schedule of hours will not be worked out until later, when we have more knowledge of the contents of the course.

BOSTON, MASS.,
January 10, 1928.

T. J. BRADLEY, *Chairman.*

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

THE TEACHING OF BOTANY TO PHARMACEUTICAL STUDENTS.

BY HEBER W. YOUNGKEN.*

The editor of this Department will not attempt to comment upon the teaching of botany as that subject is not a specialty with him and he will therefore leave the discussion of it to those who are prepared to discuss it intelligently.

However, I do wish to support and emphasize what the author says about "standardizing methods." For years there have been a few members of the A. A. C. P. who have advocated standardizing methods of instruction. I have always been opposed to it and will oppose any efforts to saddle upon the Association anything that will attempt to destroy the originality and initiative of any instructor. Methods that are highly successful in the hands of one instructor may be the ruination of the work of another. As Professor Youngken puts it, the context of a course should be pretty well standardized, at least the minimum subject matter, but the methods to be used in presenting this subject matter must *always* be left to the good judgment of the instructor. Nothing will stultify pharmaceutical education, or any education, as quickly as the standardization of methods of presentation.

C. B. JORDAN, Editor.

The teaching of botany in Colleges of Pharmacy of America appears to be more varied in extent, methods and illustrations employed than that of, perhaps, any other science entering into the pharmaceutical curriculum. In many of the University schools, pharmacy students are taught this subject in common with the students of liberal arts and science courses and so are really receiving general botany. In some of the strictly professional pharmaceutical colleges, general botany is also presented, while in others, as in a few University schools, varied specialized courses with more or less pharmaceutical bearing are offered.

It is not the intention of this paper to criticize the variety of methods employed, for the writer thereof is of the unswerving opinion that every teacher of botany should be given the broadest latitude of freedom in presenting this subject, so long as the minimum list of topics under the subject of botany in the Pharmaceutical Syllabus and the botanical findings of the Commonwealth Study of Pharmacy are included in the course.

He regards all attempts at standardizing methods of presenting this subject and of illustrations of a specific nature as tending to weaken the influence of the teacher and the individuality of the institution. Whether the teacher follows the evolutionary, the morphological or some other method should be left entirely to his or her preference, so long as there is a proper accomplishment of the end desired.

I believe, however, in the standardization of a minimum list of topics which should be included in the botanical course of a pharmaceutical college. Such a list should include all botanical terms excepting names of plants, employed in the latest editions of the United States Pharmacopœia, the National Formulary and the United States Dispensatory. Without the basic training in the understanding

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of these, the student is handicapped in pursuing the more advanced and applied subjects of Pharmacognosy and Organic Materia Medica.

One of the problems confronting every teacher of Botany in a Pharmaceutical institution during the present age is that of interesting his pupils in a subject which is new to many of them and laden with many more technical terms than that of any other branch in the pharmaceutical curriculum. There are some who would solve this problem along lines of least resistance by teaching very elementary botany to their first-year students. I consider that dangerous, since the teacher is only postponing the burden to the second or third year and the student is improperly prepared to tackle Pharmacognosy.

It has always seemed illogical to me to conceive of High-School graduates of normal minds as unable to digest and assimilate Botany of first-year college grade when only a generation ago the average student entering our medical colleges had but one year of high-school preparation with which to master the more difficult subject of first-year Human Anatomy.

The obstacles encountered by the average teacher may be largely attributed to the present-day craze for pleasure and the inadequate high-school training of some of the pupils. The side shows of college life consume much of the time that should be devoted to mental and physical development.

To combat these conditions, the teacher of Botany must make his course interesting and attractive. He should be inspired with his subject so as to impart his enthusiasm for it to his students. Object lessons, using numerous charts, lantern slides, medicinal plants, blackboard sketches, crude drugs, abundant laboratory material all add to the attractiveness of the subject and tend to heighten the students' interest.

I believe it good practice to avoid all signs of being on the defensive while teaching this subject. I have known of some teachers to openly make excuses as to why Botany had to be taught. Such procedure immediately impresses the student-body with the belief that they are taking an unnecessary subject. The direct bearing of the subject of plants upon Pharmacognosy and Materia Medica, and, in fact, the very existence and health of man can be pointed out without recourse to excuses for its presentation.

I find it good practice to take beginners on a field trip as soon as possible after the opening of their course and require them to take notes on the plants observed, including statements made in the field on a number of them.

Now, as to the departments of botanical inquiry which should receive the greatest stress, I would place Morphology, including Gross Anatomy, Histology and Cytology, first; and Taxonomy, second. Economic Botany, Geographical Botany, Physiology, Ecology, Heredity, Plant Breeding and other phases of the science can be used to advantage as connective tissue in order to help the students fix the morphologic and taxonomic data and enhance their interest.

I believe it is a mistake to give pharmaceutical students the same course in Botany as that offered to academic students. In many academic institutions this has a physiological basis and the students do not assimilate sufficient of the kind of Botany best adapted to their needs.

Our duty is not to train botanists but pharmacists. The course we offer should have a pharmaceutical connection through the use of as many illustrations and

materials from medicinal plants as can be properly worked into the schedule. A medicinal plant garden is a valuable asset in this connection.

If we are to provide students with the armament essential to properly cope with the botanical phases of Pharmacognosy and Materia Medica, if we are to prepare them to interpret with intelligence the botanical monographs constantly appearing in pharmaceutical literature, then the emphasis in our botanical teaching should be placed on those aspects of the subject which are in most direct and fundamental relation to the principal objectives to be attained, namely, Plant Morphology and Plant Taxonomy.

THE PHARMACIST AND THE LAW

BY HOWARD KIRK,* EDITOR OF THIS DEPARTMENT.

A friend writes: "If you were to mix axlegrease and talcum powder and put it in a can and label it 'Kirko,' and then advertise the compound as a cure for chilblains, is there any thing in the law to stop you?"

Nothing, we reply, except certain State laws and the Federal postal laws and the Pure Food and Drug Law and possibly some others. All because we have used the word "cure." But suppose we don't say on the label that the stuff will "cure" anything. We say it is "good for" chilblains—or better still, "used for" those articles. What law are we violating? "Recommended for" will also get by. We had better be a little cautious with "Physicians recommend," for the Government might round up some physicians who wouldn't. But if we stick to "used for" we can sell 'em anything, so long as it isn't positively harmful.

Do we hear you say that axlegrease and talcum powder won't cure anything? What difference does that make? *"De minimis non curat lex."*

There are plenty of Kirkos on the market, with just about the therapeutic value of talcum powder and axlegrease. Their presence on the shelves of our drug stores constitutes the meanest kind of a fraud—a fraud on the sick.

* * * * *

Lawyers have a saying that "If you want to find the law, look in the dissenting opinion." They figure that if a judge cares enough about a case to write a dissenting opinion, he is likely to fortify it with some real law.

Take, for instance, the dissenting opinion of Justice Oliver Wendell Holmes, of the Supreme Court of the United States, in the case which gave rise to all our discussion about resale price maintenance. This was the case of Dr. Miles Medical Company *v.* John D. Park & Sons Co., reported in 220 U. S. 373 (1911). Dr. Miles desired to maintain a resale price for his products, and entered into a series of contracts with certain drug concerns, by which they agreed to sell the Miles products to the public for the prices named. Park & Sons secured a quantity of these products from a number of the customers of Miles, and then proceeded to sell the same to the general public at cut-rate prices. Dr. Miles sought to have Park & Sons restrained by injunction from cutting his prices.

The United States Supreme Court refused to grant the injunction, holding

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that the agreements between Miles and his customers to maintian a resale price were in unlawful restraint of trade. The Court, speaking by Mr. Justice Hughes, said:

> The bill asserts the importance of a standard retail price and alleges generally that confusion and damage have resulted from sales at less than the prices fixed. But the advantage of established retail prices primarily concerns the dealers. The enlarged profits which would result from adherence to the established rates would go to them and not to the complainant. It is through the inability of the favored dealers to realize these profits, on account of the described competition, that the complainant works out its alleged injury.

This is the gist of the opinion—that dealers, the business men, have no right to their enlarged profits. (It must be remembered that this was 1911, when a great wave of sympathy for the "common people" was sweeping over the land.) Now let us listen to what Justice Holmes has to say by way of dissent:

> This is a bill to restrain the defendant from inducing, by corruption and fraud, agents of the plaintiff and purchasers from it to break their contracts not to sell its goods below a certain price.* * * *
>
> I think that, at least, it is safe to say that the most enlightened judicial policy is to let people manage their own business in their own way, unless the ground for interference is very clear. What, then, is the ground upon which we interfere in the present case? Of course, it is not the interest of the producer. No one, I judge, cares for that. It can hardly be the interest of subordinate vendors, as there seems to be no particular reason for preferring them to the originator and first vendor of the product.

Then, the Justice says, the solicitude of the law must be for the general public. The populace must be protected against high prices:

> On that point I confess I am in a minority as to larger issues than are concerned here. I think that we greatly exaggerate the value and importance to the public of competition in the production or distribution of an article (here it is only distribution) as fixing a fair price.

The Justice takes a "flyer" into the realm of psychology:

> What really fixes that is the competition of conflicting desires. We, none of us, can have as much as we want of all the things that we want. Therefore, we have to choose. As soon as the price of something that we want goes above the point at which we are willing to give up other things to have that, we cease to buy it and buy something else.
>
> Of course, I am speaking of things that we can get along without. There may be necessaries that sooner or later must be dealt with like short rations in a shipwreck.* * * *
>
> A manufacturing company knows better than we do what will enable it to do the best business.

Then follows this stern condemnation:

> I cannot believe that in the long run the public will profit by this court *permitting knaves to cut reasonable prices for some ulterior purpose of their own* and thus to impair, if not to destroy, the production and sale of articles which it is assumed to be desirable that the public should be able to get.* * * *
>
> I think also that the importance of the question and the popularity of what I deem mistaken notions make it my duty to express my view in this dissent.

Some folks think it is *lesé majesté* to criticise our Supreme Court. Very well, then, we won't do it. We'll let Justice Holmes do it.

But wasn't it Abraham Lincoln who dared criticise the Dred Scott decision? It seems to us that he said something about the Supreme Court being wrong in

that case, and about his intention to try to make them change that decision. So we have a fairly strong precedent if we try a little criticism ourselves.

* * * * *

Judge Oliver B. Dickinson, of the United States District Court for the Eastern District of Pennsylvania, has filed a most interesting opinion in the Drug Store Ownership case recently instituted by the Louis K. Liggett Company against the Attorney General of Pennsylvania. The Pennsylvania Act of 1927 forbids the ownership of drug stores in that State by any person who is not a pharmacist. The prohibition applies to individuals, partners, stockholders and members of corporations. It is a drastic statute, and its progress through the courts is being watched with interest by lawyers throughout the country.

There was no question about the right of a State Legislature to prohibit the *management* of a drug store by anyone other than a pharmacist. The State's authority comes within the ordinary police power, for the protection of the public in the dispensing of medicines and drugs. But the question of *ownership* presented a different problem. Was the State interested, and had the State a right to be interested, in the man or group of men who claimed such ownership?

* * * * *

The Liggett Company sought to prevent the enforcement of the provisions of the Act. It charged that the Act was an unreasonable and arbitrary interference with its business, its freedom of contract, and was likewise an "impairment of existing contracts" which it had made. In effect, the Liggett Company claimed that the Act amounted to a denial of the right of property without due process of law.

* * * * *

Judge Dickinson, after deciding that the Court had jurisdiction, says:

> This takes us back to the question of whether we are prepared to find that the public has no concern in the business of a drug store or the calling of a pharmacist. If we do so find, we do it with the knowledge open to all and common to very many, that at one time in all parts of the country, and still in what are called the rural districts, the local pharmacist or druggist serves many of his customers and patrons as their physician. Confidence in his judgment and skill had much to do with this practice; economy had perhaps more. So general was it that the physician of the neighborhood was likewise the druggist.

The Judge, thereupon, dwells on the personal relation existing between the old-time physician-druggist and his customers. He considers the question whether that relation should still exist, in this day of cut-rate stores and proprietary medicines.

> We, of course, recognize the force of the argument addressed to us based upon the distinction between a law which forbade anyone other than a skilled pharmacist to compound medicines, and another law which forbade anyone other than pharmacists to have a share in the ownership in the business of a drug store. Even here, however, we are unable to say that there is not a substantial relation of ownership to the public interests.
>
> The medicines must be in the store before they can be dispensed to those who come to the store for the help which medicines can afford them.
>
> What is there is dictated, *not* by the judgment of the pharmacist who hands it out to customers, but by those who have *financial control* of the business.

It may be the legislature thought that a corporate owner, in purchasing drugs, might give a greater regard to the price than to the quality; and if such was the thought of the legislature, can this Court say it was without a valid connection with the public interests, and so unreasonable as to be unlawful?

A most interesting parallel is then drawn:

A number of years ago the business of selling liquor was wholly in the hands of those who sold it. Inn-keepers and tavern-keepers stood high in the respect of their neighbors. The practice grew up of brewers and distillers taking over the ownership of places where intoxicating liquors were sold. The saloon, when ownership and management became separated, soon became a nuisance and a menace, so that its abolishment was demanded and no one at any time would wish to witness its return.* * * *

That financial ownership interest and managerial sense of responsibility each have a relation to a wise public policy, and hence to the public interest, is evidenced by the experience of the Courts in Pennsylvania upon which was thrust the responsibility of granting liquor licenses.

Every judge who had to do with this duty was soon brought to realize the element of danger to the public conduct of taverns and saloons, the moment the profits from the sales of liquor went to owners who were removed from and had no sense of the responsibility of management.

Judge Dickinson then likewise wanders into the psychological area:

There enters into every business the two motives, of a wish for profit and a sense of duty obligation towards those with whom the management deals. When these are joined the latter operates to some extent; the moment they are separated the former is in sole control. This thought deals with the relation between things which should be joined and the public policy of not permitting them to be separated.

He then decides—

Because of our inability to make the finding that the (1927) Act of Assembly has no substantial relation to the public interest, we cannot hold it to be unconstitutional.

* * * * *

Argument on the appeal of this case will be heard by the Supreme Court of the United States in the month of October of this year.

REMOVING SILVER NITRATE STAINS.

The Hospital Corps Quarterly (supplement to *U. S. Naval Medical Bulletin*, of January) states that stains of silver nitrate may readily be removed by applying a solution of 5 Gm. of mercuric chloride and the same weight of ammonium chloride in 40 cc. of distilled water.

SODIUM SULPHIDE IN PYORRHŒA.

S. C. Miller and S. Sorrin (*Dental Cosmos*, November 1927, through *Chemist and Druggist*) suggest the use of sodium sulphide as an adjunct to the usual treatment of pyorrhœa. The formula for the solution is: Sodium sulphide, 70 Gm.; sodium carbonate, 20 Gm.; water, 1 ounce.

Following scaling, curetting, etc., the above solution is used. Because this agent acts slowly, a carrier of absorbent cotton or absorbent points is employed to introduce and maintain it in position. These are immersed in the solution and carried down to the bottom of the pocket in line with the long axis of the tooth, with a pointed instrument, aided by a foil carrier and curettes. The points remain in position for about two minutes, and after that time they are removed. The pocket is again gently curetted, endeavoring to remove all detached epithelium which has been loosened by the sodium sulphide. Bleeding should always be induced at this point. The gingival tissue is now pressed firmly, but not too vigorously, against the tooth, and held in apposition with it for two minutes. The pocket is then left undisturbed for a week or more.

AS A MAN THINKETH SO WILL HE ACT.*

BY EDWARD SWALLOW.

There is a man in Detroit, Mich., who is doing some mighty good work by spreading his practical ideas of teaching the young children of America to act right by first thinking according to reason. Mr. J. F. Wright is this constructive philosopher who dares in this day to challenge our system of education as being wanting in the background of reason and common sense. Mr. Wright believes in educating the child to think out for itself the thing that is best for it—use its reasoning powers so as to grow up with greater chances of success and what constitutes good living generally.

We pharmacists have passed through a period of thinking during the past two or three decades nothing short of a revolution as far as the professional part of the calling is concerned. Broadly speaking, we began some years ago, to think more and more along commercial lines, and less along those lines that have to do with our science and art. This has not been the fault of the colleges of pharmacy or those journals that really represent American pharmacy—these have bravely stuck to their guns in defending the profession against the onslaughts made upon it by commercial interests and the increase in the number of drug stores throughout the land—this latter thing being, as many think, the main reason why pharmacy seems to be attenuated in America, so to say.

The pharmacist of thirty years ago was already suffering from the effects of too much competition, both in regard to the business end of the drug store and the purely professional part—too many professional cooks were already "spoiling the broth" of the prescription business.

This crowded condition in the drug trade produced thoughts, naturally enough, of which was the best and easiest way to survive. Alas, for the idea of making pharmacy one of the learned professions second only in importance to that of medicine, the average pharmacist began to think about side-lines and anything which he might turn into his register some much needed profits. He, the much too-crowded druggist, as it were, "treading on the other's corns," began forgetting to draw upon his knowledge and science to help him keep his head above the waters of commercialism that threatened to destroy him financially; like a drowning man, he grasped at the first thing to keep him from sinking out of sight.

Professional pharmacy began to be less thought of among the army of druggists, an ever increasing one, and the time came when the average pharmacist engaged in retailing allowed himself to think very little of his science and art and more about his side-lines—goods that were entirely foreign to the drug store of thirty years ago. We hear and read a whole lot of complaints from druggists who claim justly enough that there is now very little professional business attached to the average drug store. We might pause awhile between the selling of alarm clocks or ladies' stockings, and ask ourselves how we have become super saturated with the amazing number of side-lines and miscellaneous merchandise finding room upon our shelves to the exclusion of our own made preparations *which nowadays we have thought out of existence.*

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* Specially written for the JOURNAL OF THE A. PH. A.

The question might well be put: Have we been thinking right in regard to our profession, its opportunities for creating profit with dignity to ourselves?

Have we been thinking of how to make a dollar by selling and distributing side-lines that belong to other trades, the grocer, the hardware store and the restaurant, and in some cases, the toy shop?

Can it be that we druggists, registered pharmacists, with a fair kind of scientific knowledge and training, have gotten our gray matter, those wonderful cells within which lies the power of thought, into such a state of inertia that we cannot think of anything but how best to sell side-lines in competition with almost every other trade?

A profession generally is no better than its individual unit, and as it takes thought to lead to action, we American pharmacists are functioning according to our thoughts—we cannot get away from this fact. If we have any cause for complaint, we must blame ourselves, each one of us—we are all "in the same boat," a boat that some surmise is leaving the good old ship of Pharmacy to carry none but the hospital pharmacist, and the manufacturing pharmacist supplying us with preparations that we are too lazy or indifferent to make for ourselves.

As the Mr. Wright alluded to believes, "the man who changes the standard of his life for the better through reason is a stronger, safer and happier man than the one who changes through fear of punishment." As a man thinketh, so will he act. Have we lost the ability to think about such things as biologicals, urine analysis and the making and selling of our own preparations?

COD-LIVER OIL STOCKS TESTED FOR VITAMINS.

During 1927 the Department of Agriculture conducted an extensive survey of extracts of cod-liver oil and of various products alleged to contain the vitamins of cod-liver oil found in interstate commerce. A biological examination for the presence of vitamins A and D in these products showed that many of the extracts and concentrates examined were virtually devoid of vitamin A and that few contained any material amount of vitamin D. Several of these articles have been used extensively in the manufacture of so-called cod-liver oil compound tablets and other preparations.

Products represented as concentrates of cod-liver oil should contain vitamins A and D in concentrations reasonably higher than those of a good grade of cod-liver oil. Statements regarding the therapeutic effects of the preparations should be limited to those that can be fully substantiated by the concensus of present-day medical opinion. Investigagations of this class of products will be continued.

Compilation of Food and Drug Laws. Published by Standard Remedies Publishing Company, Washington, D. C., E. F. Kemp, Editor. Price $5.00.

This is the eleventh edition of the compilation and has been brought up-to-date. The volume contains 1116 pages and constitutes a digest of State, Federal and Canadian laws relating to foods, drugs, pharmacy, poisons, narcotics, insecticides, fungicides, caustic acids, weights and measures, sample distribution, stock medicines, alcohol, prohibition, advertising, trademarks and trade practices, and a synopsis of Latin-American drug regulations.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

CHICAGO.

The 171st meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held January 17, 1928, at the University of Illinois School of Pharmacy. Preceding this regular meeting a dinner was given at the Hotel La Salle in honor of the guest, Dr. F. O. Taylor.

President Gathercoal called the meeting to order and the report of the Secretary was presented. Secretary's report: During the year 1927, eight meetings, namely the 163–170th, with an average attendance of about fifty. All the meetings were held at the University of Illinois School of Pharmacy Building. The speakers included Prof. Newcomb, Messrs. Antonow, Michels, Kolb, Prof. Hogstad, Dean Day, Secretary Henry, Prof. Terry, Dr. Nielson and Dr. Moore.

The December meeting was devoted to entertainment.

During the year seventy-four members resigned, two deceased and two moved away. To offset this forty-six new members were added, hence the net membership December 31, 1927 was 442.

Financial Statement.

Balance Jan. 1, 1927	$130.31
Contributions from members	132.60
Commissions (new members)	12.00
Contribution to campaign	449.00
Receipts due	58.00
	$781.91

Printing and postage	$462.44
Speakers	55.90
Dinners	6.00
Taxi and phone	4.50
Record book	2.85
Cash on hand 1–1–28	250.22
	$781.91

The report of the nominating committee was read and the nominees were unanimously elected.

President, E. N. Gathercoal
First Vice-President, J. Harry Lindahl
Second Vice-President, H. J. Holthoefer
Third Vice-President, R. E. Terry
Secretary-Treasurer, S. W. Morrison.

Committee Chairmen.

Membership, C. P. Van Schaack
Legislation, Julius Riemenschneider
Practice, Irwin A. Becker
Medical Relations, Dr. Bernard Fantus
Publicity, Samuel C. Henry.

President Gathercoal spoke of the favorable report of the treasury and mentioned the coming speakers who will appear before the Chicago Branch.

Dr. Taylor was then introduced and spoke on the subject "New Remedies in Pharmacy." He told of the great change going on in medicine, of the thousands of different remedies, some of which have been almost forgotten, while others are being re-discovered. He told of cod-liver oil, which has been used for cen-

turies but has only recently been analyzed and standardized. The value of ephedrine, an old Chinese drug, has only recently been brought before the people. Myrtillin, an extract from blue berry or buckleberry, is now being tried in treatment of diabetes. He mentioned the comparative recent discovery of the value of ceanothus to aid in coagulation of blood. Work being done at the University of Illinois, where synthetic compounds of the fatty acids of chaulmoogra oil are being prepared and tested was related by Dr. Taylor. Hundreds of various compounds of iron and arsenic have been prepared in an effort to find better remedies. Bismuth has found a new use in the treatment of syphilis, and a new water-soluble compound (Bismuth thioglycolate) has just been perfected by Parke, Davis & Co. Antimony tartrate is also being used for tropical diseases. Attempts are being made to find uses for nickel and cobalt to activate insulin. Vanadium compounds are also suggested for their antiseptic effect. Lead has been suggested for the treatment of cancer. Manganese compounds are now being used for dementia præcox. A more recent treatment for hook worm is tetrachlorethylene, which is less toxic than other treatments but more toxic to the worm. He told of experiments in new anæsthetics, including prophylene, butylene, acetylene, etc.

Dextrose is now being used extensively and lactose has also found a use for alleviation of varicose veins. The use of dyes has gained prominence as valuable antiseptics such as acriflavine, scarlet red, gentian violet and others.

The work done in the field of organic drugs is so vast that one can hardly keep pace with them. Synthalin, a derivative of guanidin has been developed and tried for the treatment of diabetes. Iodekon, an iodine compound for X-ray work, amidoxylbenzoate for arthritis, and synthetic menthol are recent achievements in medicine. Literally, hundreds of anæsthetics have been developed but only a few have found general use.

In gland therapy a great number of products have been produced but comparatively little is known concerning their use.

Thyroxin (the active constituent of thyroid) has been synthetically produced by Dr. Harrington during the past year. A liver extract has been prepared for the treatment of anemia or the reduction of high blood pressure. Dr. Abel has succeeded in isolating a crystalline substance from insulin.

Dr. Kamm of Parke, Davis & Co. has separated two different active constituents from the posterior lobe of the pituitary gland, having the oxytoxic and blood pressure raising principles and the diuretic substance. Concentration and potency has been increased.

A general discussion followed with Dr. Fantus, Prof. Day, Gathercoal, Messrs. Hynes and Kolb participating. Dr. Taylor was given a rising vote of thanks.

S. W. MORRISON, *Secretary.*

BOTANY'S DEBT TO PHARMACY.

The reviewer of Dr. G. Claridge Druce's latest book, "The Flora of Buckinghamshire," closes his review of the book in *Nature* with the remark that: "This work emphasizes once more the debt that British field botany owes to the pharmaceutical profession in general, and to the author in particular."—*Pharm. Jour. and Pharm.*

SYNTHETIC MENTHOL.

A circular of information from Schimmel & Co.'s reports on Synthetic Menthol, a new product of their laboratories, states that like the natural, this synthetic is lævorotatory with a melting point of 35° and that in appearance and odor it is very similar to the natural. They also state that tests have shown the synthetic to be slightly more active physiologically, but less toxic than the natural.

STABILITY OF MERCURIC OXIDE OINTMENTS.

Bergwall, according to *Pharm. Zentralh.*, 68, 667 (1927), has shown that mercuric oxide ointments are not protected by being kept in brown glass containers; also, that the stronger ointments keep better than the weaker preparations. He suggests that the ointments be kept protected against light.

OINTMENT OF ORTHOFORM, BORIC ACID AND ZINC OXIDE.

J. Robert reports that ointments of above components in the following quantities, boric acid, 3 Gm.; orthoform, 2 Gm.; petrolatum, 30 Gm., can be made into a smooth ointment by separately sifting the fine powders and mixing them thoroughly, and then incorporating the powders with the ointment base, in a warm mortar, by trituration.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1927–1928.

Office of the Secretary, 10 West Chase St., Baltimore, Md.

LETTER NO. 6.

January 24, 1928.

To the Members of the Council:

55. Award of the Contract for Printing and Mailing the Journal for 1928. Motion No. 16 (See Council Letter No. 5, page 88) has been carried and the Mack Printing Company of Easton, Pa., has been awarded the contract for printing and mailing the JOURNAL for 1928.

56. Award of the Contract for the Manufacture and Distribution of the Year Book, Volume 15, for 1926. Motion No. 17 (See Council Letter No. 5, page 88) has been carried and the contract for printing and distributing Volume 15 of the YEAR BOOK has been awarded to the Lord Baltimore Press, Baltimore, Md.

57. Election of Members. Motion No. 18 (See Council Letter No. 5, page 89) and *Motion No. 19* (See Council Letter No. 5, page 91) have been carried and applicants for membership Nos. 86 to 111 inclusive, and applicants for membership Nos. H-340 to H-491 inclusive, are declared elected.

58. Budget for 1928. Motion No. 20 (See Council Letter No. 5, page 91) has been carried and the budget, as submitted, is adopted.

59. Place and Date of the Next Annual Meeting. Since Council Letter No. 4 (see pages 1210–1212 of that letter) was issued the following letter has been received from Dr. H. V. Arny:

"I have not written you on the subject of time and place of next meeting because of pressure of other matters but now I would like to express my opinion as follows:

"1. *As to Place:* I think we should meet on the Pacific Coast. The mere fact that Seattle does not want us this year should not affect our decision. It would be interesting to try a year of going it on our own.

"2. If the Pacific Coast is impractical, let us abandon Poland Spring and meet in Boston the latter part of August.

"3. *As to reversing the vote at St. Louis,* could not the Council hold a post-card referendum participated in by all of those registered at the St. Louis meeting and particularly those who were members of the House of Delegates? I should think that a vote of reconsideration under such circumstances would be entirely legal.

"4. This episode emphasizes the need of sympathetic relations between the A. PH. A. Committee on Time and Place and the similar body of the N. A. R. D. This spectacle of the A. PH. A. meeting in Maine and the N. A. R. D. meeting in California the same week of the year is scarcely edifying."

The Secretary has also received letters from a number of Secretaries of State Pharmaceutical Associations, from Deans and Executive Officers of Schools and Colleges of Pharmacy, and other members of the ASSOCIATION, asking that the date of the meeting be advanced if is at all possible. In these letters it is emphasized that to hold the meeting after September first would be a serious inconvenience to all and especially to those connected with teaching institutions. Reference was also made in several letters to the impossibility of attending the meetings of the N. A. R. D. and the A. PH. A. if the date under consideration was adopted. In two letters, the hope was also expressed that the meeting could be held on the West Coast.

The following letter has since been received from T. J. Bradley, Chairman of the Committee on Place of Meeting:

"As the dates heretofore talked of for the 1928 meeting are unsatisfactory for two distinct reasons, which have been stated at length in a previous council letter, steps have been taken to change the time to a week that is likely to suit a larger number of members. It is not necessary to describe the steps in detail here, so they will be outlined, only.

"The hotels at Poland Spring were told that the dates selected must be approved by the Council, and they have been notified that they must be cancelled, with an explanation of the reasons therefore, and their reply, expressing their regret that they cannot accommodate us at these summer resort hotels in August, has been received.

"Poland Spring is only about twenty-five miles from Portland, Maine, where conditions are very different. Portland is the gateway to Maine and has several fine, European plan hotels, including a new first class one, The Eastland, which was opened during the past year. Most of the business of these hotels is transient and they can accommodate us splendidly. I made a special trip to Portland last Friday and looked into the matter very thoroughly, and am convinced that we can secure accommodations of the grade we are accustomed to, at a satisfactory time. The Eastland and Congress Square hotels, under the same management, adjoin each other and have a total of more than seven hundred rooms, with accommodations for more than a thousand persons, and a fine assortment of conveniently located meeting rooms, which will be available for our use at reasonable rates, if we meet there.

"As Portland and Poland Spring are so near each other, the selection of a headquarters hotel in Portland will not involve any question of procedure, and I therefore make the following motions, and request that they be submitted to the Council immediately, as these questions need to be decided very soon."

Since the receipt of this letter, Mr. W. Bruce Philip visited the office in Baltimore and, after discussing the question, communicated with Chairman Bradley in reference to the possibility of making satisfactory arrangements for holding the 1928 meeting in Salt Lake City, Utah, as the Utah Pharmaceutical Association had generously extended an invitation to the ASSOCIATION for consideration if such arrangements could be made.

The following letter has just been received from Mr. Philip with the request that it be submitted to the Council:

"From Dean Bradley's telegram and letter I appreciate the inadvisability of urging that the next annual meeting of the A. PH. A. be held in the West. The retail druggists of Northern and Central California will work hard for the coming Convention that will probably be held in Portland, Maine, August 20th.

"As was well suggested in Washington, during our recent conference there, both Associations will learn much from this conflict of two distant places for their annual meetings.

"I am wiring my office in San Francisco to bulletin this week the proposed change and each week we will urge an attendance to the Portland meeting.

"Someone from our district will attend the August meeting of the A. PH. A. in an endeavor to show the friendly Western spirit and also to urge and invite, those who can, to come to San Francisco September 10th to 14th, to attend the annual meeting of the N. A. R. D.

"Let me express the appreciation, of the members of the organizations that I represent, to those who agreed with me and endeavored to move this year's meeting of the A. PH. A. to some Western City."

(*Motion No. 21.*) (Substituted for *Motion No. 13.* See Council Letter No. 4, page 1211.) *It is moved by Bradley that the Association meet during the week of August 20, 1928 in Portland, Me., and that the Eastland Hotel be selected as the official headquarters.*

60. Election of Local Secretary. Mr. Edgar F. Carswell of Gorham, Me., is nominated for Local Secretary for 1927–1928 by T. J. Bradley who writes:

"Mr. Carswell is a Past-President of the Maine State Association and is now a member of the Maine State Board of Pharmacy. He has attended several of our conventions and spoke briefly at St. Louis, when the House of Delegates voted to go to Maine."

(*Motion No. 22.*) *It is moved by Bradley that Edgar F. Carswell of Gorham, Me., be elected Local Secretary of the A. Ph. A. for 1927–1928.*

Item No. 61 is still under discussion.

62. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 112, Harry Warner Ayers, 1312 E. 63rd St., Seattle, Wash.; No. 113, Henry Berg, 169 East 105th St., New York, N. Y.; No. 114, Auguste Boas, 1631 Euclid St., N.W., Washington, D. C.; No. 115, Norman Broker, Cor. 15th & Columbia Ave., Philadelphia, Pa.; No. 116, Warren W. Burgess, 112 West Ninth St., Kansas City, Mo.; No. 117, George L. Buhrman, 4531 Easton Ave., St. Louis, Mo.; No. 118, Marguerite Caroline Dimler, 104 Ninth St., Hoboken, N. J.; No. 119, William H. Gross, 4430 Chestnut St., Philadelphia, Pa.; No. 120, Wilfred Howden, 4760 Penn. St., Frankford, Philadelphia, Pa.; No. 121, Morris H. Kaitz, 1417 South St., Philadelphia, Pa.;

No. 122, Otto H. Kessel, 516 Cooper Ave., Saginaw, Mich.; No. 123, Earl N. Manchester, Watson Library, University of Kansas, Lawrence, Kans.; No. 124, J. W. Slocum, 404 West Ashland Ave., Indianola, Iowa; No. 125, Dayle A. Snyder, 900 S. Oak Park Ave., Oak Park, Ill.; No. 126, Erich W. Schwartze, Mellon Institute, Pittsburgh, Pa.; No. 127, Vivian Josephine Stuchlik, 3859 W. 26th St., Chicago, Ill.; No. 128, Chas. M. Twining, Fourth & Parker Sts., Berkley, Calif.

(*Motion No. 24.*) Vote on applications for active membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

63. Applicants for Membership on Account of Contributions to the Headquarters Building Fund. The following non-members of the A. PH. A. have pledged $25.00 or more to the Headquarters Building Fund and have made a cash payment of $5.00 or more. They are entitled to membership and you are requested to vote on the applications which have been properly endorsed.

No. H-492, Raymond Delbert Adams, Libby & 14th St., Clarkston, Wash.; H-493, Leo Amada, 743 High St., Newark, N. J.; H-494, Michael P. Araneo, 83 Booraem Ave., Jersey City, N. J.; H-495, Alfred Louis Barthen, 15 Hill St., Carnegie, Pa.; H-496, William Bassoff, 208 Columbia St., Brooklyn, N. Y.; H-497, Arthur William Bechtold, 7016 Manse St., Forest Hills, L. I., N. Y.; H-498, Herschel Weatch Bennett, Sullivan, Ind.; H-499, Milton Berman, 572 Stewart Place, Cincinnati, Ohio; H-500, Harry Bilawsky, 225 Bainbridge St., Brooklyn, N. Y.; H-501, Moses Leon Biller, 115 Columbia St., New York, N. Y.; H-502, Veryl Watter Boette, 751 So. Broadway, Los Angeles, Calif.; H-503, Jeny Borrelli, 308 Oak St., New Haven, Conn.; H-504, Emanuel Borschover, 184 Goldsmith Ave., Newark, N. J.; H-505, R. H. Braun, Miami Ave., Madeira, Ohio; H-506, Frances A. Brown, 1815 Jones St., Indianapolis, Ind.; H-507, George Wilson Brown, 1901 Lincoln Ave., Evansville, Ind.; H-508, John Vincent Burke, 44 Newport St., Dorchester, Mass.; H-509, James A. Carter, Bloomington, Ind.; H-510, Woods Clifton, 2163 Evelyn St., Memphis, Tenn.; H-511, Edgar G. Coates, 501 So. Michigan St., South Bend, Ind.; H-512 Thomas G. Combs, Gratz, Ky.; H-513, Sol I. Cytron, 1254 N. Leffingwell, St. Louis, Mo.; H-514, B. Lanier Dansby, Box E., Titusville, Fla.; H-515, George B. Dean, 224 N. Walnut St., Bloomington, Ind.; H-516, Henry Doder, 2426 Lawrence Ave., Toledo, Ohio; H-517, William Hugh Eccles, 71 Johnston Ave., Cohoes, N. Y.; H-518, Monroe Eisenberg, 352 Hooper St., Brooklyn, N. Y.; H-519, Virginia Christine Ellis, 101 Maple Ave., Covington, Va.; H-520, Theodore William Eyolfson, Wynyard, Saskatchewan; H-521, Adolph A. Fahlstrom, 4145 Upton Ave., So., Minneapolis, Minn.; H-522, Daisy A. Frick, 326 Broadway, Audubon, Iowa; H-523, Leroy Benjamin Gliddon, Hampshire, Ill.; H-524, Fermo Goduti, 40 Dover St., West Somerville, Mass.; H-525, Melvin Goldberg, 24 Normandy St., Roxbury, Mass.; H-526, Lawrence Hatfield, 731 E. 4th St., Seymour, Ind.; H-527, Otto Daniel Haury, Jr., 1800 State St., Schenectady, N. Y.; H-528, James Thomas Hayden, 71 So. 9th St., Newark, N. J.; H-529, Ernest Gabriel Hiler, White Meadow Ave., Rockaway, N. J.; H-530, Naomi F. Holden, 523 Hieff St., Winona, Minn.; H-531, Joseph Cameron Hooper, 4157 S. Western Blvd., Chicago, Ill.; H-532, Harry Horin, 554 Kossuth St., Bridgeport, Conn.; H-533, Vernon Hoos, 5232 Kenmore Ave., Chicago, Ill.; H-534, Paul William Hyde, 508 Main St., Clifton Forge, Va.; H-535, Morris Jacques, 1372 Shakespear Ave., New York, N. Y.; H-536, Olaf Julius Johnson, 920 E. 19th St., Minneapolis, Minn.; H-537, Herbert B. Kaplan, 185 Vergen Ave., Jersey City, N. J.; H-538, Edwin Kaufmann, 47 Mulberry St., Fall River, Mass.; H-539, Edward A. Klaus, 146 Crescent Ave., Buffalo, N. Y.; H-540, Herman Klein, 652 E. 161st St., New York, N. Y.; H-541, Alvin Henry Kuttler, 2074 West 91st St., Cleveland, Ohio; H-542, Delwin A. La May, 858 Dewey Ave., Rochester, N. Y.; H-543, Edward Latunik, 315 Elder St., Brooklyn, N. Y.; H-544, Ludvik Frank Letak, 12106 Angelus Ave., Cleveland, Ohio; H-545, Alexander Levy, 556 Ashford St., Brooklyn, N. Y.; H-546, F. Harold Lewis, 3817 Liberty Heights Ave., Baltimore, Md.; H-547, Victor Lewitus, 115 W. 68th St., New York, N. Y.; H-548, Ralph James Longbottom, Stratton, Nebr.; H-549, Lester Henderson Lowe, 304 Water St., New Lexington, Ohio; H-550, Louis Malament, 316 S. Fourth St., Brooklyn, N. Y.; H-551, Edward William Maraziti, 208 Holmes St., Boonton, N. J.; H-552, Verle Eston McCarty, Ingalls, Ind.; H-553, Thos. M. McCloskey, 918 Bankhead Ave., Atlanta, Ga.; H-554, William C. Meyer, 5388 Union Blvd., St. Louis, Mo.; H-555, Robert Virgin Mohler, 434 North Main St., South Bend, Ind.; H-556, George Steven

Pauer, 2206 West Blvd., Cleveland, Ohio; H-557, Isaac Noodelman, 1130 Tinton Ave., New York, N. Y.; H-558, Alfred Lowell Pederson, 12 South St., Medfield, Mass.; H-559, Benjamin Pekarsky, 1965 Bryant Ave., Nye, N. Y.; H-560, Rudolph R. Pellage, 1441 Benteau Ave., Chicago, Ill.; H-561, Paul Robert Phillips, 941 W. 33rd St., Indianapolis, Ind.; H-562, Bronislaus J. Pienkowski, 61 Hopkins Ave., Jersey City, N. J.; H-563, Anthony Popkiewicz, 3126 Superior St., E., Detroit, Mich.; H-564, Anthony Pumo, 224 Suydam St., Brooklyn, N. Y.; H-565, Isaac Reifman, 1395 Bristow St., Bronx, New York, N. Y.; H-566, Francis Bruer Riggs, 200 S. Ninth St., Keokuk, Iowa; H-567, Richard R. Riggs, 1414—12th Ave., No., Fargo, N. Dak.; H-568, Roy M. Riley, 110 E. Douglas St., Wichita, Kans.; H-569, Philip Thorndyke Rippner, 18 Lawrence St., So. Norwalk, Conn.; H-570, Felix Roser, 159 Montgomery Pl., Paterson, N. J.; H-571, Frank Joseph Rossano, St. Johns Ave. & Division St., Yonkers, N. Y.; H-572, Sidney Rubenstein, 505 Essex St., Brooklyn, N. Y.; H-573, Abe Charles Sack, 513 Boulevard, Bayonne, N. J.; H-574, Harry W. Schaum, 3700 N. Grand Ave., St. Louis, Mo.; H-575, Sidney Mortimer Schefkind, 121 No. Main St., Paterson, N. J.; H-576, Felix Howard Shaffer, 39 Thatford Ave., Brooklyn, N. Y.; H-577, Abraham Shenkow, 1135 St. Johns Place, Brooklyn, N. Y.; H-578, Martin Silberman, 421 E. 65th St., New York, N. Y., H-579, Agnes E. Smeja, 85 Woltz Ave., Buffalo, N. Y.; H-580, Lewis Sidney Smith, Bastrop, Texas; H-581, Samuel Smith, 1031 Bergen St., Brooklyn, N. Y.; H-582, Bernard J. Spaeth, 3130 No. Grand Ave., St. Louis, Mo.; H-583, Carl August Spalding, Wanda, Minn.; H-584, John J. Spatafora, 801 DeSiard St., Monroe, La.; H-585, Philip Elson Stanley, Seal Harbor, Me.; H-586, Roland Milo Summers, 162 Hollywood St., Oberlin, Ohio; H-587, Henry Sussman, 1956 Crotona Parkway, New York, N. Y.; H-588, Sidney Taffel, 632 Eastern Parkway, Brooklyn, N. Y.; H-589, Nishan Tususian, 2423 Bathgate Ave., New York, N. Y.; H-590, Lloyd Clarence Waag, Roseau, Minn.; H-591, Chas. S. Walter, 901—4½ St., S. W., Washington, D. C.; H-592, Milton H. Wilder, 408 Hartzell Ave., Niles, Ohio; H-593, Robert Willard Johnson, Box 144, Scottsburg, Ind.; H-594, Donald Earl Woodruff, 616 Clifton Ave., Clifton, N. J.; H-595, Martin Richard Worob, 345 Hamilton Ave., Paterson, N. J.; H-596, Max Young, 369 New Lots Ave., Brooklyn, N. Y.

(*Motion No. 25.*) Vote on applications of contributors to the Headquarters Building Fund for Membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

LETTER NO. 7.

February 1, 1928.

To the Members of the Council:

64. Recipe Book. Chairman Lascoff and Editor Griffith have requested that a meeting of the Sub-Committee on Scope of the Committee on Recipe Book be authorized by the Council and that this meeting, which will not exceed two days, be held in New York, N. Y., during February 1928.

Galley proofs of the manuscript of the book have been distributed in duplicate to all members of the Committee on Recipe Book and most of the members of the Committee have returned the duplicates with their criticisms and suggestions. Chairman Lascoff and Editor Griffith express appreciation of the interest displayed by the members of the Committee and of the many suggestions made for the further improvement of the content and character of the Recipe Book.

Editor Griffith will assemble this information for the consideration of the Sub-Committee on Scope and believes, as does the Chairman, that a final review of the text before the page proofs are prepared is desirable and that the results will fully justify the expense of the proposed meeting. Page proofs of the revised manuscript will be sent out promptly after the proposed meeting and it is hoped to have the Recipe Book ready for delivery in about three months thereafter.

The request for the meeting of the Sub-Committee on Scope has been submitted to the Committee on Publications and to the Committee on Finance and has the approval of these committees of the Council. No special appropriation is necessary.

The Sub-Committee on Scope is composed of the following members:

Ivor Griffith, *Chairman*, Philadelphia, Pa.
J. Leon Lascoff, *Ex-officio*, New York, N. Y.
W. L. Scoville, Detroit, Mich.
R. P. Fischelis, Trenton, N. J.
S. L. Hilton, Washington, D. C.
C. P. Wimmer, New York, N. Y.

Chairman DuMez of the Committee on Publications and Editor Eberle will attend the meeting, if held, also Secretary Kelly unless other engagements prevent.

(*Motion No. 26.*) It is moved by Kelly that a meeting of the Sub-Committee on Scope of the Committee on Recipe Book be authorized and that this meeting be held in New York, N. Y., during February 1928.

LETTER NO. 8.

To the Members of the Council:

No. 65.—It is with deep regret that the death of Mister Edward Mallinckrodt, Honorary President of the AMERICAN PHARMACEUTICAL ASSOCIATION, is announced to the Council.

Mr. Mallinckrodt died of pneumonia at his home in St. Louis, Mo., on February 1st. He and Mr. W. H. Rogers, his predecessor as Honorary President, were the oldest members of the ASSOCIATION having joined in 1869.

The ASSOCIATION was represented at the funeral by a committee, and Chairman Hilton has appointed the following members:

L. G. Blakeslee, St. Louis, Mo.
E. G. Eberle, Baltimore, Md.
C. E. Caspari, St. Louis, Mo.

as a committee to draw up resolutions on Mr. Mallinckrodt's death.

E. F. KELLY, *Secretary.*

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Z. Untersuch. Lebensm., 53 (1927), 425; through *Pharm. Ztg.*, 72 (1927), 1593
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EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, GEO. M. BERINGER, H. C. CHRISTENSEN, J. A. KOCH, J. H. BEAL, W. B. DAY, T. J. BRADLEY. *Ex-Officio Members:* C. W. JOHNSON, *President;* AMBROSE HUNSBERGER, JOSEPH JACOBS, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* LEONARD SELTZER, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; W. L. SCOVILLE, *Chairman,* N. F. Revision Committee; the Chairmen of the Sections, A. PH. A.; L. W. ROWE, M. N. FORD, ADLEY B. NICHOLS, C. LEONARD O'CONNELL, W. P. PORTERFIELD; EDWARD SPEASE, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; A. C. TAYLOR, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P.

NEW AND NONOFFICIAL REMEDIES.

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

POLLEN EXTRACTS-CUTTER (See New and Nonofficial Remedies, 1927, p. 34; *Jour. A. M. A.*, June 11, 1927, p. 1891).

Also marketed in single vial packages containing 5 cc. of a 1:100 solution.

POLLEN EXTRACTS CONCENTRATED-CUTTER.—Liquids obtained by extracting the dried pollen of plants with a liquid consisting of 67 per cent of glycerin and 33 per cent of a buffered saline solution.

Actions and Uses.—See Allergic Protein Preparations, New and Nonofficial Remedies, 1927, p. 23.

Dosage.—See Allergic Protein Preparations, New and Nonofficial Remedies, 1927, p. 23.

Pollen extracts concentrated-Cutter are marketed in single vial packages containing 5 cc.

Manufactured by the Cutter Laboratory, Berkeley, Calif. No U. S. patent or trademark.

* * * * * * * * * * * *

Pollen extracts concentrated-Cutter are prepared by extracting the dried pollen with a menstruum composed of 67 per cent of glycerin and 33 per cent of an aqueous solution containing potassium dihydrogen phosphate (KH_2PO_4), 0.0908 per cent; soldium phosphate ($Na_2HPO_4.12\ H_2O$), 0.238 per cent, and sodium chloride, 0.85 per cent. The extract is clarified by Berkefeld filtration. The finished liquid is a 3 per cent extract of the dried pollen, each cubic centimeter representing 0.03 Gm. of dried pollen.

From *Jour. A. M. A.*, Nov. 26, 1927.

ANAEROBIC ANTITOXIN.—An antitoxic serum prepared by immunizing animals against the anaerobic bacteria found in gangrenous wounds.

Actions and Uses.—Evidence has been published to indicate that the use of anaerobic toxin preparations may be of value in the treatment of gas gangrene.

Lederle Antitoxin Laboratories.

Anaerobic Antitoxin (Polyvalent)-Lederle.—Gas Gangrene Antitoxin.—An antitoxic serum prepared by immunizing horses with gradually increasing doses of B. tetani prepared according to the methods used in the manufacture of tetanus antitoxin, and of B. welchii and Vibrion septique both obtained from anaerobic broth cultures of the organisms. All three toxins are injected simultaneously into the horse. When a potent antitoxin serum (as indicated by potency tests applied to trial bleedings) is obtained, blood is drawn aseptically from the jugular vein and the clear serum is drawn off after the blood clots. The serum is clarified and sterilized. The potency tests used are made as follows: Tests for the content of tetanus antitoxin and B. welchii (perfringens) antitoxin are made according to the methods prescribed by the U. S. Hygienic, Laboratory; for determining the strength of the Vibrion septique antitoxin, serial dilutions of the antitoxin are mixed with Vibrion septique toxin and the mixtures injected into rabbits, the Vibrion septique toxin having been previously standardized for its M.L.D. by injection into rabbits. The product is marketed in 100-cc. vials, each cubic centimeter containing 50 units of tetanus antitoxin, 2 units of perfringens (B. welchii) antitoxin, and sufficient Vibrion septique antitoxin to neutralize one thousand M.L.D. of the Vibrion septique toxin.

Dosage.—Initial doses of 100 to 200 cc., followed in six to eight hours by 100 cc., and every twelve hours thereafter by 100 cc. as required.

DEXTROSE (See New and Nonofficial Remedies, 1927, p. 229).

The following dosage forms have been accepted:

Ampuls Dextrose (d-Glucose) 10 Gm., 20 cc.: Each ampule contains Dextrose, U. S. P., 10 Gm.; cresol, 0.1 per cent; distilled water, to make 20 cc.; buffered with dibasic sodium phosphate anhydrous, 0.44 per cent and potassium biphosphate anhydrous, 0.072 per cent.

Prepared by H. K. Mulford Company, Philadelphia.

Ampuls Dextrose (d-Glucose) 25 Gm., 50 cc.: Each ampule contains Dextrose, U. S. P., 25 Gm.; cresol, 0.1 per cent; distilled water, to make 50 cc.; buffered with dibasic sodium phosphate anhydrous, 0.44 per cent and potassium biphosphate anhydrous, 0.072 per cent.

Prepared by H. K. Mulford Company, Philadelphia.

From *Jour. A. M. A.*, Dec. 10, 1927.

INSULIN-SQUIBB (See New and Nonofficial Remedies, 1927, p. 197).

The following dosage form has been accepted:

Insulin-Squibb, 100 units, 10 cc.: Each cubic centimeter contains 100 units.

STAPHYLOCOCCUS VACCINE (See New and Nonofficial Remedies, 1927, p. 363).

Abbott Laboratories, North Chicago, Ill.

Staphylococcus Mixed Bacterin.—Each cubic centimeter contains 4000 million killed *Staphylococcus albus* and *Staphylococcus aureus* in equal proportions; marketed in single 5-cc. vial packages, in single 20-cc. vial packages, and in packages of six 1-cc. ampules.

ERYTHROL TETRANITRATE (See New and Nonofficial Remedies, 1927, p. 267).

The following dosage form has been accepted:
Erythrol Tetranitrate Tablets-Merck, 1/4 grain.

From *Jour. A. M. A.*, Dec. 24, 1927.

TYPHOID VACCINE (See New and Nonofficial Remedies, 1927, p. 365).

Abbott Laboratories, North Chicago.

Typhoid Prophylactic (See New and Nonofficial Remedies, 1927, p. 366). Also marketed in 5-cc. vials containing 1 billion killed typhoid bacilli per cubic centimeter; in 20-cc. vials containing 1 billion killed typhoid bacilli per cubic centimeter.

From *Jour. A. M. A.*, Dec. 31, 1927.

BACILLUS ACIDOPHILUS MILK-HERMES.—A whole milk cultured with *B. acidophilus*. It contains not less than 200 million of viable organisms (*B. acidophilus*) per cubic centimeter at the time of sale.

Actions and Uses.—See Lactic Acid-Producing Organisms and Preparations, New and Nonofficial Remedies, 1927, p. 216.

Dosage.—For adults the contents of one bottle (950 cc.) in divided doses daily. To overcome the natural tendency to gas formation at first, it is best to begin with 500 cc. in divided doses and increase to the full dose in two or three days. Lactose may be administered with the milk when indicated. When used for infant feeding, from 250 to 500 cc. of the milk diluted with water that has been boiled and cooled is advised. Bacillus acidophilus milk-Hermes is marketed in bottles containing 950 cc. (1 quart); it must be kept in a cool place and should be used prior to the date stamped on the cap.

Manufactured by the Hermes-Groves Dairy Co., Pittsburgh, Pa. No U. S. patent or trademark.

PHANODORN.—Cyclobarbital.—Cyclohexenyl ethyl barbituric acid.—Δ'-cyclohexenyl ethyl malonyl-urea.—2,4,6, trioxy-5-cyclohexenyl-ethyl-pyrimidin.—$CH_2CH_2CH_2CH_2$-$CH{:}C.(C_2H_5).CNHCO.CO.NHCO$. Phanodorn differs from barbital (diethyl-barbituric acid) in that one of the ethyl groups of barbital is replaced by a cyclohexenyl group.

Actions and Uses.—The actions and uses of phanodorn resemble those of barbital, but it is more than twice as toxic as barbital and the therapeutic dose is correspondingly smaller. It is eliminated more rapidly than barbital; hence the action is not so lasting. This is an advantage when it is used merely to put one to sleep where sleep will then continue without its further action. It is used mainly for its sedative action in nervous insomnia, neurasthenia, psychoses and various types of insomnia. It probably augments the action of analgesics such as amidopyrine, as other barbituric acid derivatives do.

Dosage.—For the mildest type of simple insomnia, 0.1 Gm. (1 1/2 grains) or 1/2 tablet. Intractable or obstinate insomnia, from 0.2 to 0.4 Gm. (3 to 6 grains) or one to two tablets. The larger dose should not be repeated within less than twelve hours. The average dose is 0.2 Gm. (3 grains), or one tablet.

Manufactured by the Bayer Company, Inc., Rensselaer, N. Y. (Winthrop Chemical Company, Inc., New York, distributor). U. S. patent applied for.

Phanodorn occurs as a white, crystalline, odorless powder, with a bitter taste; readily soluble in alcohol, about 1 in 5, and ether, about 1 in 10; very slightly soluble in benzene and cold water. A saturated aqueous solution is acid to litmus paper. It melts at 171–174 C.

Dissolve 0.1 Gm. in 1 cc. of sulphuric acid: the liquid assumes a yellow color, changing quickly to orange, and finally to red. Place 0.3 Gm. in a 25-cc. glass stoppered cylinder, add 1-cc. normal sodium hydroxide solution and 5-cc. water, shake the contents for one minute, filter through paper and divide into two portions: the solutions yield a white precipitate with 1 cc. of mercuric chloride solution, soluble in 5 cc. of ammonia water; the solution yields a white precipitate with 2 cc. of silver nitrate solution, soluble in 5 cc. of ammonia water. Boil 0.5 Gm. with 5 cc. of a 20 per cent sodium hydroxide solution: it is decomposed with the evolution of ammonia.

Boil 0.5 Gm. with 50 cc. of water for two minutes; no odor develops; cool and filter: separate portions of 10 cc. each of the filtrate yield no opalescence with 1 cc. of diluted nitric acid and 1 cc. of silver nitrate solution (*chloride*); no turbidity with 1 cc. of diluted nitric acid and 1 cc. of barium nitrate solution (*sulphate*); no coloration or precipitation on saturation with hydrogen sulphide (*salts of heavy metals*).

Incinerate about 1 Gm. accurately weighed: there is not more than 0.01 per cent residue.

Dissolve about 0.5 Gm., accurately weighed, in 25 cc. of previously neutralized alcohol, dilute with an equal volume of water and titrate with tenth-normal sodium hydroxide solution using thymolphthalein as an indicator: the amount of tenth-normal sodium hydroxide solution consumed corresponds to not less than 98.5 per cent nor more than 101.5 per cent.

From *Jour. A. M. A.*, January 14, 1928.

SIMPLIFICATION OF ADHESIVE PLASTER AND SURGICAL GAUZE.

A conference on the simplification of adhesive plaster and surgical gauze convened Febru-

ary 15th; a preliminary meeting was held last September. As a result of the latter meeting the following widths and lengths for aedhesive plaster have been suggested for elimination: Seven inches in 1- and 5-yard rolls; one-quarter inch spools in 5- and 10-yards; 2½ inch and 4 inch in 5- and 10-yard spools.

NEW DENATURANTS FOR ALCOHOL.

The Commissioner of Prohibition, Dr. J. M. Doran, has announced orally that he believed the Bureau of Prohibition had attained success in its long search for alcohol denaturants that are non-poisonous and that may not be removed from the alcohol by bootleggers.

Dr. Doran explained that the Bureau's chemical experts are continuing their experiments to submit the formulas to all character of tests possible, but that the tests have given every assurance of the inability to remove the denaturants employed.

MERGER OF THE UNITED DRUG COMPANY AND STERLING PRODUCTS, INC.

Merger of the United Drug Company, Boston, and Sterling Products, Inc., Wheeling, W. Va., and New York, will be voted on by the stockholders of the two corporations at special meetings. The plan for consummating the long predicted combination of these two large concerns calls for the formation of a holding company, to be known as Drug Products, Inc. This Company will own the entire capital stock of the merging concerns, which it will acquire on the basis of two and one-half shares of its stock for each share of stock of a reorganized United Drug Company and one and three-quarters shares for each share of stock of Sterling Products, Inc. As a first step toward the merger the present United Drug Company is to be liquidated through the formation of a new company of the same name, which will assume all liabilities of the present company, pay to it an amount in cash sufficient to redeem its first preferred stock at par and accrued dividends, and issue to the present company an amount of common stock equal to the present stock of the latter.

PERSONAL AND NEWS ITEMS.

W. Bruce Philip, Secretary of the San Francisco and Alameda County Retail Druggists' Associations, visited the offices of the AMERICAN PHARMACEUTICAL ASSOCIATION last month. He reports that the arrangements for the meeting of the National Association of Retail Druggists, September 10th, are progressing nicely. The genial Secretary is ever ready in promoting association work.

Dean John R. Minehart, Temple University, contends that the recurrent use of some hypnotic drugs suggests the necessity of a caution statement on the label.

Matthew Lyle Spencer will be inaugurated President of the University of Washington (Seattle), February 22nd.

Arthur Floyd Schlichting, formerly director of the research and manufacturing departments of William R. Warner & Co., St. Louis, is now professor of Theoretical and Practical Pharmacy at St. Louis College of Pharmacy, succeeding the late Professor Hemm.

Prof. Otto Raubenheimer addressed the New York German Apothecaries' Society at the February meeting on Friedrich Wöhler. **Dr. C. P. Wimmer** spoke of his chemical contributions and Dr. Friedrich Klein on anecdotes of Wöhler's period.

Among other slogans and messages used by **Leon Hale,** Tampa, Fla. for advertising his pharmacy, we find the following:

"Prescriptions filled in our store receive more than the ordinary care, but not more than they should." "Not content with all the care one man can give, his work is carefully checked by another. Nor do we stop with carefulness, no drug of doubtful purity or quality is used at Hale's." "These extra precautions are a safeguard to you and bring to our store a greater business than most drug stores enjoy."

Z. E. Marvin, retail pharmacist in Dallas, opened a new store in his own building, one of the city's tall structures, last month. He kept open house on the first day and it is reported that more than 30,000 persons visited the store during the day. The store is said to be one of the finest of modern drug stores.

Mrs. Wilford Harrison, wife of last year's President of the National Association of Boards of Pharmacy, is recovering, following a serious surgical operation.

W. H. Cousins, editor of the *Southern Pharmaceutical Journal,* was a speaker at a sales force convention of Dover Manufacturing Company, Dover, Ohio.

The *National Drug Clerk* has started a series of articles on the two Official Standards—"The United States Pharmacopœia" and "National Formulary," under the editorial

direction of **C. H. Bowersox.** The introductory article appeared in the January issue of the publication and the series promises to be of value to pharmacists by extending the prescribing of officials by physicians.

Robert J. Frick, editor of the *Kentucky Druggist* is now a Colonel, having been appointed on the staff of Governor William J. Fields.

Arthur Hulett, a former Vice-President of the AMERICAN PHARMACEUTICAL ASSOCIATION, former Secretary of the Arizona Board of Pharmacy and active in everything that pertains to pharmacy in his State, uses natural scrub oak from his summer home in the display windows of his own manufactured products.

Lucien N. Brunswig, President of the Brunswig Drug Company, has donated 1000 volumes to the University of Southern California. Mr. Brunswig collected the books while on a recent visit to France.

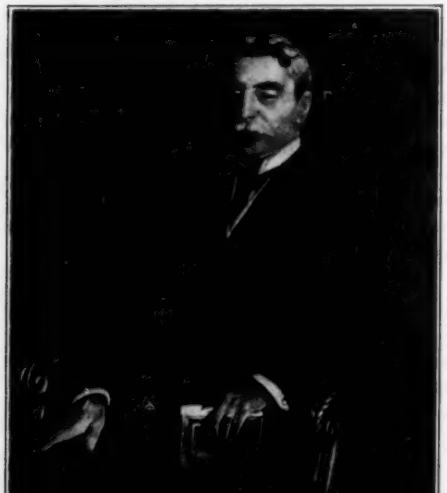
A supplement of the *Bulletin of the New York Academy of Medicine,* for January, presents a symposium in memory of Lister. A half-tone of the great surgeon is the frontispiece and the reading text includes a sketch and a number of contributions relating to Lister's activities. Bernard Sachs is Chairman and Charles E. Atwood is Secretary of the Section of Historical and Cultural Medicine.

The *Nation's Health* published a paper on "Relation of the Physiological Assay to Medicine," delivered before Baltimore Branch A. PH. A., by E. W. Schwartze, of the Mellon Institute of Industrial Research, University of Pittsburgh.

OBITUARY.

EDWARD MALLINCKRODT.

Edward Mallinckrodt, Honorary President of the AMERICAN PHARMACEUTICAL ASSOCIATION, died at his home in St. Louis, February 1st of pneumonia. The deceased was born



EDWARD MALLINCKRODT.

in St. Louis, January 21, 1845, son of Emil and Eleanor M., and educated in the public schools and at Webster College. In 1864, he and his brother Otto were students in the Fresenius Laboratory at Wiesbaden, Germany, and thereafter served as apprentices in the De Haen Chemical Works near Hanover. On returning to St. Louis, in 1867, they organized with their brother the firm G. Mallinckrodt & Co. and began the manufacture of chemicals; two of the brothers died about ten years after the founding of the business which was continued by Edward and, as is well known, it has grown to large proportions. Mr. Mallinckrodt was founder and President of the National Ammonia Company, with connections and plants in a number of manufacturing centers of this country, Canada, Australia, etc. His real estate holdings in St. Louis were large and he was associated officially and as stockholder with many financial and industrial enterprises.

Mr. Mallinckrodt held membership in quite a number of associations and was actively interested in civic organizations, education institutions, and societies for bettering conditions, beautifying the city and aiding in the relief of afflicted. He was Vice-President of the Board of Control of St. Louis Art Museum and his collection of paintings is well known; he was a lover of flowers, had his own private conservatory and took an active interest in the Missouri Botanical Gardens, of which he was a director. He was President of St. Louis Library Association, director of Washington University, member of the AMERICAN PHARMACEUTICAL ASSOCIATION,[1] the

[1] Mr. Mallinckrodt and Mr. Rogers, Honorary President of last year, joined the ASSOCIATION in 1869—the latter is now the senior member of the A. PH. A.

American Association for the Advancement of Science; the American Chemical Society; the Society of Chemical Industries of Great Britain; Deutscher Chemiker Verein of Berlin, Germany; St. Louis Academy of Science, etc.; he belonged to the Commercial Round Table, St. Louis, University, Bogey, Noonday and St. Louis Country clubs.

Among his large gifts may be mentioned that of $416,000 to Washington University, $100,000 to St. Louis Children's Hospital, $500,000 for a new chemical laboratory at Harvard.

Mrs. Mallinckrodt (née Miss Jennie Anderson) died about fifteen years ago; a son, Edward, Jr., a step-brother, Emil and a sister Mrs. Adele Schulenburg survive the deceased.

Mr. O. L. Biebinger, President of Mallinckrodt Chemical Works, paid Mr. Mallinckrodt the following tribute:

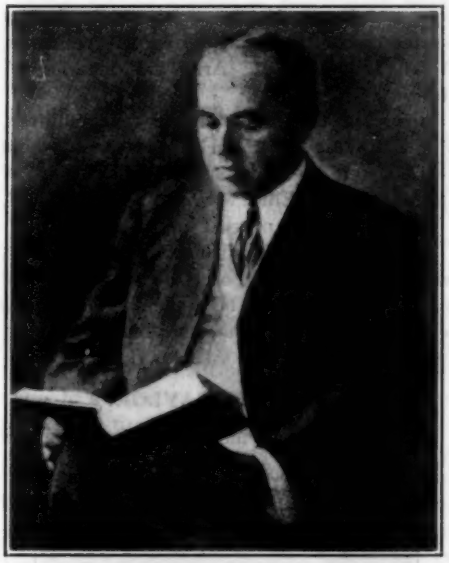
"He was a remarkable man, with the highest sense of honor, integrity and business ethics. In the manufacture of medical products his principle was to produce nothing but the best. One of his chief concerns in life was the advancement of science and education, and he did much to give young men opportunities for scientific training."

Sketches of the late Honorary President will be found in the JOURNAL, A. PH. A., for September 1927 and for 1919.

CASWELL ARMSTRONG MAYO.

Caswell A. Mayo, sixty-second President of the AMERICAN PHARMACEUTICAL ASSOCIATION, died January 13th at his home in Cincinnati. The deceased was born in Columbus, Miss., July 5, 1862; here he received his early education and training.

While a student at the Philadelphia College of Pharmacy, he was employed in the Pharmacy of William Procter, Jr. Company. After graduation, he became associate editor of the *Druggists' Circular* (1887–1891), and of the *Oil, Paint and Drug Reporter* from 1891–1892 and for a brief period he edited *Merck's Report*. In 1892, he succeeded Dr. Frederick A. Castle and Dr. Charles Rice as editor of the American Druggist with which the Pharmaceutical Record was consolidated after the death of its editor, Prof. P. W. Bedford. This editorship continued until 1919 when Mr. Mayo became associated with William S. Merrell Company, in charge of its publications. Most of the latter work was given up on his election as dean of New Jersey College of Pharmacy. He returned to the editorial desk and contributed to the columns of the *American Druggist*, the *Druggists' Circular* and, at other periods, prior to this time, he was assistant editor of the New York Medical Journal, editor of *Therapeutic Digest* and *Caillards Medical Journal*. He was also for a time dean of Queen City College of Pharmacy.



CASWELL A. MAYO.

Always active and interested in pharmaceutical matters, he shared in the work of conventions and added to the interest and zest of the annual occasions; for a number of years he assisted the installing officers by presenting the officers-elect of the AMERICAN PHARMACEUTICAL ASSOCIATION, with happy introductions.

For sixteen years he was Trustee of the College of Pharmacy of Columbia University and was one of the founders of the New York Pharmaceutical Conference. While he did not become a member of the AMERICAN PHARMACEUTICAL ASSOCIATION until 1893, Mr. Mayo attended a number of annual meetings before that time and was present at most of the A. PH. A. conventions thereafter. For seventeen years he was Chairman of the Transportation Committee, served as a member of a number of other committees; as Secretary of the Scientific Section, Chairman and Secretary of the Section on Historical Pharmacy, member of the Council during several years, as *Vice-President* and then as *President* of the ASSOCIATION.

He was a member of the Cincinnati Library Club, Wild Flower Preservation Society, Ohio Pharmaceutical Association and a director of Ohio Botanic Garden Society.

The funeral services, both in Cincinnati and New York City, were well attended. The AMERICAN PHARMACEUTICAL ASSOCIATION was represented by former President J. U. Lloyd, C. G. Merrell, Charles Ehlers, Henry J. Dusterberg and Frank H. Freericks, at the former ceremonies, and at the latter by Past-Presidents, H. H. Rusby, H. V. Arny and Charles W. Holton.

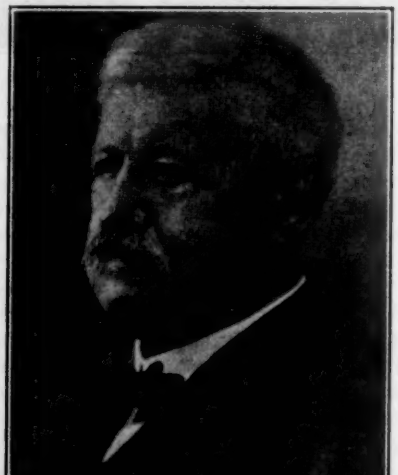
Surviving the deceased are four children, Misses Phyllis and Pamela Mayo with whom he made his home, Caswell A. Mayo, Jr., of Dallas, Tex. and Elliot Mayo, of Montclair, N. J.

Sympathy is expressed to the bereaved.

Mr. Mayo worked faithfully as a journalist, with sincerity of purpose; he was a man of high ideals and will be remembered for his services in behalf of pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION.

EDGAR D. TAYLOR.

Edgar D. Taylor—member of the AMERICAN PHARMACEUTICAL ASSOCIATON, and President



E. D. TAYLOR.

of the National Wholesale Druggists' Association, 1907-1908—died January 27th, at his home in Richmond, Va., aged about ninety years.

Mr. Taylor served the Confederacy in the army during the war between the States. Soon after returning from service he joined Powers-Taylor Drug Company; in 1872, he was made a junior partner and, following the death of Mr. Powers, in 1908, became President of the Company.

He was one of the leaders in the N. W. D. A. during its earlier period and active in its committees and councils for many years; at the time of his death he was a Senior Councilor.

While never active in the AMERICAN PHARMACEUTICAL ASSOCIATION he always, whenever the opportunity was presented, expressed a high estimate of its services to the drug industries.

JAMES E. LILLY.

James E. Lilly, brother of Eli Lilly, founder of the Lilly Laboratories and Vice-President of Eli Lilly & Company, died at Indianapolis January 31st, aged 84 years.

Mr. Lilly worked for a time for his brother, in Greencastle, Ind., and later owned a pharmacy in Evansville. Thereafter he was associated with Cloud & Akin, wholesale druggists of Evansville, William R. Warner & Co., of Philadelphia, and then with his brother. In the latter connection he was first a salesman and established a branch for the firm in Kansas City; he became a Vice-President and director of the corporation about 1889, but has not been active in the business for more than twenty years.

Mr. Noel writes of the deceased: "The simplicity of his habits and his living were most marked. He was possessed of fine literary tastes and took great pride in his extensive library. Travel appealed to him greatly, and he had a capacity for absorbing information from his trips that was surprising."

Walter D. Rowles, manager of the Bayer Company, died January 17th, after an illness of more than a year. His first connection with pharmacy was in Berkshire, England. Coming to this country he entered the field of journalism in Detroit, then he became associated with Frederick Stearns & Company and, thereafter, for a period of fifteen years, with Parke, Davis & Co., Inc. In 1913, he became associated with Sterling Products, Inc., first in England and returned after about ten years to take the management of the Bayer

Company in New York City and continued this association up to the time of his demise. His widow and one daughter survive the deceased. Interment was at Battle Creek, Mich.

SOCIETIES AND COLLEGES.

MINNESOTA PHARMACEUTICAL ASSOCIATION.

The forty-fourth annual convention of the Minnesota Pharmaceutical Association is now in session at the Hotel Nicollet, Minneapolis. Indications are that it will surpass all previous events. The program committee has succeeded in lining up as speakers men of prominence in public life and others equally prominent in pharmaceutical affairs and business circles, among them being Congressman Clyde Kelly, co-author of the Capper-Kelly bill.

IOWA PHARMACEUTICAL ASSOCIATION.

The regular sessions of the Iowa Pharmaceutical Association will begin Wednesday morning, February 29th, and continue right through until Friday. Each and every forenoon will be given over to distinguished speakers, men thoroughly familiar with the merchandizing and professional sides of pharmacy. Special noonday luncheons have been arranged at which meetings of the advisory board, special committees, boards of pharmacy, etc., will be taken care of. Congressman Clyde Kelly, of Pennsylvania is to be one of the speakers.

The sixth annual Northwest Drug Show this year will be held in conjunction with the annual meeting of the Iowa Pharmaceutical Association, in Shrine Temple, Des Moines. Robert M. Gibson, Chairman of the drug show committee, reports practically every booth sold.

WINTER SESSION NEW JERSEY PHARMACEUTICAL ASSOCIATION.

New Jersey Pharmaceutical Association met at Trenton, January 26th, to discuss legislative matters and for the annual Dinner-Dance. Reports were made by officers and committees and representatives of County Associations. Some of the legislators were in attendance. The interest in pharmacy of New Jersey's Governor is encouraging—see the Department of the National Association of Boards of Pharmacy.

DRUG RESEARCH BUREAU WOULD SIMPLIFY STOCKS.

After several months of preliminary work, the directing committee of the Druggists' Research Bureau, A. Kiefer Mayer, Chairman, is now preparing a final copy of a questionnaire on stock simplification in the toilet goods department of retail drug stores. This final questionnaire was drawn up after a test questionnaire had been sent 400 retailers in New York, Philadelphia and Indiana. Some 300 of these were returned filled out and it was on the basis of these returns that the final copy was made.

The preliminary test disclosed the fact that the tabulation of answers to the questionnaires will unquestionably be of the greatest value to wholesaler, retailer and manufacturer, according to Secretary E. L. Newcomb.

The bureau will send out 75,000 copies of the questionnaire and 50,000 copies of a preliminary report on the test questionnaire, by P. C. Olsen. These will be distributed to retailers by salesmen of N. W. D. A. members.

Mr. Mayer has just completed a slide film on stock simplification and this is now ready for use by wholesalers. The film illustrates methods and results obtained through stock simplification.

The New York office of the bureau is completing an alphabetical list by States of the 25,000 retail druggists and pharmacists who are members of the bureau. This will be published in the form of a newspaper of about 24 pages, some time this month.

PHARMACISTS' MATES ARE GRADUATED.

Certificates of graduation were awarded to twenty-three naval hospital corpsmen, representing fourteen States, who completed the prescribed course of instruction and training at the U. S. Naval Pharmacists' Mates School, Portsmouth, Va., December 7th. The graduates will be transferred to the various naval hospitals in the United States and West Indies for further training and instruction, after which they will be detailed for shipboard duty.

"FIRST AID WEEK."

The week of March 18th has been designated "First Aid Week." This is a week during which the pharmacy should receive publicity and the public be impressed with the fact that "a druggist is more than a merchant."

PHILADELPHIA DRUG EXCHANGE.

The sixty-seventh annual meeting of the Philadelphia Drug Exchange was held January 24, 1928, in the rooms of the Exchange in the Bourse Building, Philadelphia.

The annual address of Herbert R. McIlvaine, President, was read, and the reports of the board of directors and officers were presented. The following were elected for the present year: *President*, Herbert R. McIlvaine; *Vice-President*, John F. Belsterling; *Secretary*, Joseph W. England; *Treasurer*, A. L. Hilles, Jr; *Board of Directors:* C. Mahlon Kline, C. Dunning French, Benjamin S. Thorpe, H. K. Hineline, Harrison S. Hires, F. L. Bodman, Walter V. Smith, Alexander C. Fergusson.

Reports by committee chairmen were incorporated in the printed annual report, edited by Secretary Joseph W. England, as follows: Legislature, C. Mahlon Kline; Crude Drugs, Herbert R. McIlvaine; Medicinal Chemicals, F. L. Bodman; Heavy and Industrial Chemicals, Alex C. Fergusson, Jr.; Volatile Oils, John F. Pound; Biological and Pharmaceutical Products, H. H. Whyte; Paints, Oils and Varnishes, C. Dunning French; Advertising and Selling, Harrison S. Hires; Delivery and Traffic, Walter V. Smith; Accounts, Credits and Collections, H. K. Hineline; Business, Life Insurance and Fire Insurance, A. L. Hilles, Jr.

Richard V. Mattison, President of the Keasbey & Mattison Company, and Milton Campbell, President of the H. K. Mulford Company, were elected by the board of directors as honorary members of the Exchange, and appreciative letters of acceptance were read from them.

The annual dinner of the Exchange was held the evening of January 26th at the Bellevue-Stratford. Addresses were made by Harry A. Mackey, Mayor of Philadelphia; Dr. Wilmer Krusen, President of the Philadelphia College of Pharmacy and Science, on "Health and Happiness," and John Dennis Mahoney on "Hit and Run in the Drug Business."

PHARMACY WEEK IN TRINIDAD.

Conjointly with Empire Shopping Week, the Trinidad druggists held a Pharmacy Week with many attractive window displays, British goods being shown as much as possible. However, the proprietary medicines, soaps, toilet articles, etc., are mostly of American and French origin. Surgical appliances are mostly German. A great proportion of drugs used in prescriptions are American, and Great Britain contributes now only a few tinctures and raw drugs.

FOUNDERS DAY OF PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE.

Founders Day of Philadelphia College of Pharmacy will be more than a commemoration day because it will also be the opening day of its new building. An interesting program for the ceremonies, February 23rd and 24th, has been prepared to mark the event. The venerable institution has a history that is co-extensive with American pharmacy, and with new and greater facilities and opportunities its influence will continue progressively onward.

BUILDINGS FOR FACULTY OF MEDICINE AND PHARMACY OF LYONS, FRANCE.

The French correspondent of the Journal of the American Medical Association writes that the Mayor of Lyons has been informed that the Rockefeller Foundation will guarantee to the University of Lyons, for the purchase of sites and for the construction of buildings to be used by the faculté de médecine et de pharmacie, the sum of 41,206,000 francs ($1,648,240), on condition that the sum of 15,000,000 francs is supplied from other sources or furnished by the government of France. Accordingly, the President of the cabinet, in agreement with the minister of public instruction, has allotted 12,000,000 francs, payable in three annual sums. There remains only 3,000,000 francs to be guaranteed.

CONGRESS OF MEDICINE TO BE HELD IN EGYPT.

An International Congress of Tropical Medicine and Hygiene is to be held at Cairo, Egypt, in December, according to a report received by the Department of Commerce from the Acting Commercial Attache at Cairo, Charles E. Dickerson, Jr., Cairo. There will be an exhibition of drugs at the same time.

LEGAL AND LEGISLATIVE.

JOINT RESOLUTION—METRIC BILL.

Relating to the establishment of commodity quantity units for general use in merchandizing after 1935.

WHEREAS the Constitution of the United States of America provides in Section 8, Paragraph 5, that Congress has the power to fix the standard of weights and measures; and

WHEREAS there now exists a lack of uniformity in the weights and measures of the United States; and

WHEREAS these are not standardized with the weights and measures used by the vast majority of nations of the world: Therefore be it

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Department of Commerce be authorized and directed to conduct, within one year, a thorough investigation and study to determine the advisability of adopting metric weights and measures for general use in the United States. This department, after making such investigation and study, is hereby authorized to initiate and carry out, to such extent as may be deemed advisable, plans to encourage the general and common use in the United States of such system of weights and measures.

CAPPER KELLY BILL—S. 1418.

A Bill to protect trade-mark owners, distributors and the public against injurious and uneconomic practices in the distribution of articles of standard quality under a distinguishing trade-mark, brand or name.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That no contract relating to the sale or resale of a commodity which bears (or the label or container of which bears) the trade-mark, brand or name of the producer or owner of such commodity, and which is in fair and open competition with commodities of the same general class produced by others, shall be deemed to be unlawful, as against the public policy of the United States or in restraint of interstate or foreign commerce or in violation of any statute of the United States, by reason of any agreement contained in such contract:

(1) That the vendee will not resell such commodity except at the price stipulated by the vendor; and/or

(2) That the vendee will require any dealer to whom he may resell such commodity to agree that he will not in turn resell except at the price stipulated by such vendor or by such vendee.

Section 2.—Any such agreement in a contract in respect of interstate or foreign commerce in any such commodity shall be deemed to contain the implied condition that such commodity may be resold without reference to such agreement:

(1) In closing out the owner's stock for the purpose of discontinuing dealing in such commodity;

(2) With prominent notice to the public that such commodity is damaged or deteriorated in quality, if such is the case; or

(3) By a receiver, trustee or other officer acting under the orders of any court.

Section 3.—Nothing contained in this Act shall be construed as legalizing any contract or agreement between producers or between wholesalers or between retailers as to sale or resale prices.

Section 4.—No suit arising out of any such agreement shall be brought in any court of the United States in any other judicial district than that in which the defendant is an inhabitant, or in which he has a regular and established place of business. If such suit is brought in a district in which the defendant has a regular and established place of business, service of process, summons or subpoena may be made by service upon the agent or agents engaged in conducting such business in the district in which suit is brought.

Section 5.—As used in this Act:

(1) The term "producer" means grower, packer, maker, manufacturer or publisher.

(2) The term "commodity" means any subject of commerce.

(3) The term "interstate or foreign commerce" means commerce between any State, Territory, or possession, or the District of Columbia, and any place outside thereof; or between points within the same State, Territory or possession, or the District of Columbia, but through any place outside thereof; or within any Territory or possession or the District of Columbia.

Section 6.—If any provision of this Act is declared unconstitutional or the applicability thereof to any person or circumstance is held invalid, the validity of the remainder of the Act and the applicability of such provision

to other persons or circumstances shall not be affected thereby.

Section 7.—This Act may be cited as the "Fair Trade Act."

COPELAND COSMETIC BILL.

Senator Copeland, of New York, introduced a bill to regulate the manufacture and sale of toilet articles, January 4th.

The bill would prevent the shipment of preparations containing arsenic, lead salts, paraphenylenediamine, paratoluenediamine, paraphenyldiamine, mercury and all compounds of mercury except calomel, or phenol in excess of ten per cent by weight in a fatty or other solid or semisolid base, or in excess of three per cent by weight in any solution. It also provides that the name and address of the manufacturer, packer or distributor be printed on the label. Retailers are to be exempt from the penalties of the act if they have a guarantee from the producer or jobber that the goods are not misbranded.

FEDERAL NARCOTICS CONTROL BOARD.

The Federal Narcotics Control Board met in Washington, February 1st, to discuss revision of the quotas for importation of narcotic drugs. The board has under consideration the proposed draft of new regulations under the narcotic drugs import and export act.

PENNSYLVANIA OWNERSHIP LAW.

The constitutionality of the Pennsylvania Ownership Law was upheld by a decision filed in Court of Common Pleas, No. 4, Philadelphia. The George B. Evans Corporation operating a chain of drug stores, petitioned the Court for a declaratory judgment defining the rights of the corporation.

In a formal decree, entered January 7th, the Court found the new law which is supplementary to the act of 1917, requiring the employment of registered pharmacists in each pharmacy to be "within the police power of the Commonwealth of Pennsylvania; that said act does not violate any of the prohibitions expressed or implied of the Constitution of Pennsylvania or United States of America."

UNITED DRUG COMPANY WINS SUIT IN WHICH NAME "UNITED DRUG" WAS INVOLVED.

In the District Court for Eastern New York, United Drug Company won a suit involving the right to use the words "United Drug." The full title used by defendants was "United Drug Exchange."

CHEMICAL FOUNDATION GIVES $195,000 FOR COLDS STUDY.

The Chemical Foundation has given $195,000 to the School of Hygiene and Public Health of Johns Hopkins University, for a study of the origin, nature and possible cure of the common cold.

The fund is to be known as "The John J. Abel Fund for Research on the Common Cold" in honor of the professor of pharmacology of the Johns Hopkins School of Medicine, and will provide $25,000 in the first year, $35,000 in the second and $45,000 in the third, fourth and fifth years of the research work.

BOOK NOTICES AND REVIEWS.

Laboratory Manual for the Detection of Poison and Powerful Drugs. By Dr. Wilhelm Autenrieth, professor in the University of Freiburg. Authorized Translation by William H. Warren, Ph.D., professor of Organic Chemistry in Clark University, Worcester, Mass. Sixth American edition from the 5th German edition, completely revised with extensive additions. 60 illustrations, 700 + pp. xxvi. P. Blakiston's Son & Co., Publishers, Philadelphia, Pa. Price $6.00.

This authoritative work is known wherever laboratory investigations are made of potent drugs and, especially, when the effects of them result injuriously or fatally—the latter suggests the need of the former.

The preceding edition has been thoroughly revised and new matter included. The author points out that information relative to the physiological action of the more important poisons and potent drugs and knowledge of the changes which these substances undergo in the animal body is necessary for the chemist who undertakes to detect and determine poisons that have been taken by man or animal.

The translator states that by far the greater part of the new matter is to be found in the last three chapters of the book. Among the

additions considered are the organic arsenicals and quite a number of the synthetic hypnotics and sedatives. Digitalis glucosides have received fuller treatment and a number of unusual toxic substances have received consideration. Thus, referring to the general statements made, it may be informative to mention materia medica and other products which in overdose produce toxic effects, as for example: fluorides, iodides, nitrites, salvarsan, propanol, bromural, diogenal, arecoline, johimbine, tutocaine, psicaine, strophanthin, bufotalin, etc.

Certain apparatus and special analytical methods make up the subject matter of the fifth chapter; colorimetric estimation and the usefulness of microsublimation *in vacuo* are given consideration. The sixth chapter has particular interest for pharmacists on account of the assay methods of the German Pharmacopœia for alkaloids, given in full. The Appendix treats of "Meyer-Overton Theory of Narcosis," theory of alcohol narcosic, studies of narcosis, etc., and the investigation of colchicin and colchicein by Windaus and the results of Willstätter's study of the cleavage products of scopolamine.

The behavior of the constituent of poisons and potent drugs during analysis lays the basis for their study and their division into three groups, namely, those that distil with steam from acid aqueous solution are members of Group I, in the next are the non-volatiles in acid aqueous solution and Group III includes the poisonous metals. In the first are phosphorus, chloroform, aniline, alcohols, etc. The second group includes alkaloids, various synthetic compounds, glucosides, bitter principles, etc.

A systematic general procedure for the detection of poisons is given, the methods to be followed and the apparatus which is necessary or helpful.

Except, perhaps, to say that the well and favorably known work has been extended and carefully revised, comment is almost unnecessary; the publishers, also, have upheld their reputation in the production of the book.

The Theory of Emulsions and Their Technical Treatment. By William Clayton, Hon. Secretary to the British Association Committee on "Colloid Chemistry and Its General and Industrial Applications." F. G. Donnan, Chairman of the British Association. Committee on "Colloid Chemistry and Its General and Industrial Applications." Second Edition. 300 pages with 42 illustrations. P. Blakiston's Son & Co., Philadelphia, Pa., Publishers. Price $4.50.

Professor Donnan, in the "Foreword," refers to the importance of the study of emulsions and emulsification, its theoretical and practical interest. In the industries outside of pharmacy the dairy products constitute a large part of the emulsified products (natural, prepared and manufactured); rubber, if considered as an emulsion, is another item of very great and growing importance. In pharmacy the process is extensively employed for manufacturing a class of preparations known as emulsions, some of the liniments, ointments, etc., and in a related way in the manufacture of certain sprays used as insecticides, other detergents, flotation processes, etc. Deëmulsification figures prominently in some of the industrial operations, especially in drilling for petroleum oil—water becomes trapped and to some extent emulsified. Three methods of deëmulsification—electrical, chemical and mechanical are employed and described in a general way in this volume.

The bibliography is quite extensive and the list of names and references given include a number who are well known for their contributions to pharmacy; among them, H. Schelenz, L. E. Warren, Charles H. LaWall, J. C. Krantz, Jr., N. E. Gordon, E. V. Kyser, F. C. Vilbrandt, W. G. Crocket, H. E. Oesper and others. Reference is made to a number of papers published in the Journal of the American Pharmaceutical Association.

While of greatest value for libraries and class rooms it will be noted from the comment that the book has more than reference value for pharmacists.

A Florentine Diary from 1450 to 1516, by Luca Landucci. Continued by an Anonymous Writer until 1542, with notes by Iodoco Del Badia. Translated from the Italian by Alice De Rosen Jervis. Publishers, E. P. Dutton & Co., New York. Price $3.00.

The following review is based largely on one by Samuel C. Chew in the *Baltimore Sun;* the greatest part of it is embodied without change and quoted in this review. This diary was kept by an apothecary, Luca Landucci, of Florence. That he was well known in Italy is testified by contemporary manuscripts: "Landucci was not in public life, and he seems to have had no distinguished connections; but from the doorway of his shop he watched the passing pageant of Florentine life and from his customers he obtained an enormous quan-

tity of gossip, rumor and report; and all this he set down patiently and, considering the nature of his information, with surprising accuracy. He lived in the stirring period of Savonarola's reforming crusade. He witnessed the celebrated bonfire of Vanities, when the citizens followed the dictates of the great Frate and burnt their frivolous possessions.

"He was present in the Piazza when Savonarola and his two chief disciples were put to death. He watched the workmen toiling and struggling as they brought Michelangelo's 'David' from the artist's workshop to its place in the Piazza. He saw the entry into Florence of more than one Pope when the city with lavish expenditure decorated itself for the triumph.

"Life then was colorful and violet. The background of Landucci's own placid existence is a constant succession of wars. The French were in Italy. The Italian cities were constantly squabbling with one another. Plague was seldom completely absent and often raged furiously. The citizens rioted and were sternly suppressed by their governors. Crimes of violence were many, and punishments of terrific cruelty were meted out to criminals who were caught.

"Countless times did this quiet apothecary see condemned men hauled on carts to the place of execution, tortured as they were trundled through the city with red-hot pincers. The rack and thumbscrew were seldom idle. Landucci chronicles also the violences of nature; storms when lightning struck the cupolas and towers of the churches; cold so severe that the Arno froze over; floods so high that the benches in Santa Crece floated out into the square. Generally these events are regarded as portents of coming trouble and interpreted as punishment for the wickedness of the citizens. The record includes also many rumors of miracles and wonders convincingly testified to from many parts of Italy. Some holy statue sweats, the eyes of some saint in a picture move; there are miraculous fires and mysterious visions.

"Such a chronicle does not need to be read consecutively; open it at any page and you will find matter for entertainment, an astonishingly vivid evocation of the brilliant life of a brilliant city four hundred and more years ago. The translator includes the original editor's invaluable notes and has added others on subjects familiar to Italians but upon which the English or American reader may need guidance."

The translator would have added to the convenience of the reader by inserting the years during which the notes were made. For example an entry made *16th December* recites that "Cegino was beheaded in the court of the *Capitano*, for the same crime of having plotted for the Medici." The next note is dated *6th January*—no year given, and as the year of the preceding entry is not stated the dates must be retraced.

The youth, on October 15, 1450, about 14 years of age, went to learn book-keeping from a master called Callandra; he adds "Praise God! I succeeded." On 1st January, 1452, he entered the shop of the apothecary Francesco, at the sign of the *Scala*, in the *Mercato Vecchio*. He continued in this shop for 10 years. There are quite a number of references to his experiences and investments. The entries are most interesting and many have historical value.

The Apothecaries' Guild of which he was a member regulated the hours during whch the shops were to be kept open. Evidently, the apothecaries made candles, for the Guild decided that "we apothecaries could no longer make candles at two denari."

An entry of May 26, 1471, stated that he bought some of the first sugar that came to Florence from Madeira.

A note of the Diary explains the time use. The Translation states—"They then began to count from *eight o'clock p.m.*, that is, the present eight o'clock was called 24; and the present nine o'clock was called one o'clock, ten o'clock was two o'clock, etc. The idea was to count the fresh day from the hour of the sun going down on the last one."

Schimmel & Co. Report.—The annual report on essential oils and synthetic perfumes, published by Schimmel & Co., Miltitz, Germany, has been received in the United States. Fritzsche Brothers, Inc., New York City, is agent in the United States and Canada. The report consists of a bound illustrated volume of 248 pages.

Neue Arzneimittel, Spezialitäten und Geheimmittel.—Supplement of *Apotheker-Zeitung*, covering the period of April to September 1927, of preparations indicated, appearing in the publication named in numbers intervening between dates given.